'Global warming' theory does not fit with reality

The climate is giving the global warming computer projections a hard time: cooling in the wrong places and warming at the wrong times. Part 3 of Gerd Weber's report.

We conclude our three-part adaptation of Chapters 3 and 4 of the forthcoming book Global Warming, The Rest of the Story, *by Gerd R. Weber.*

Let us reiterate why the contention "We see the warming the models are predicting" is untenable:

1) Climatic averages predicted by the models have been compared with non-climatic "dips" and "spikes" in the temperature curve.

2) A global warming predicted by the models has been compared with a land-based temperature trend only, whereas a "true global" trend—comprising oceans and continents—should have been used.

3) The actual, climatically relevant warming of the atmosphere over oceans and continents has only been about one-third of what models calculate.

Even if the entire observed warming over the last 100 years were attributed to the greenhouse effect, which is highly debatable, as we will see later on, we would still have to seriously question the relevance of the model calculations, because they have us in for three times the observed temperature rise. The implications of that realization are immediately apparent: If a calculated temperature rise of 1.3° for the trace-gas increase already observed is too large by a factor of three, the predicted temperature rise for a doubling of CO_2, 6-7°, may also be too large by a factor of three, which is a fair assumption, since temperatures are expected to rise smoothly and continuously as trace-gas concentrations go up. The Intergovernmental Panel on Climate Change (IPCC) draws a different conclusion from this discrepancy. They think the observed temperatures are at the lower end of model predictions, and the difference could be due to natural variations. In the following we will analyze some of the factors which might be related to the temperature rise of the last century in more detail and see if there is some evidence for or against the greenhouse hypothesis.

Wrong timing

We are not yet satisfied with our analysis of the temperature trend of the last 100 years; we want to present the temperature history from a slightly different, but possibly even more revealing angle.

Let us imagine we are travelers in time, and we embark on a journey beginning in the year 1850. As knowledgeable people, we know about the greenhouse theory and we expect the climate to warm up by 1.3°F as we showed in the modeled greenhouse curve in Part 2 (*EIR*, Jan. 17, see Figure 2). As we travel through time, we notice that it is generally getting warmer. Especially between 1910 and 1940, there is a whopping temperature increase—not only over the continents, but also over the oceans—and by the time we reach the 1940s, temperatures over land are almost 1.3° higher, in the filtered 10-year average, than at the outset of our journey (**Figure 1a** and **b**).

If we now look the other way to the [modeled] greenhouse curve [in Part 2], we notice that temperatures should only have risen by a paltry 0.4°. Now what?

Greenhouse theory or not, at this point we can only conclude that the very largest part of the increase of 1.3° *must* have been caused by natural fluctuations in the climate system, the causes of which we do not know yet, but which we will try to analyze later on.

The temperature increase in the first part of this century, which was as large as the one predicted to occur from the trace-gas increase up into the 1980s, could therefore not have been caused by a trace-gas buildup, because that buildup did

FIGURE 1a

Observed temperature trends in the Northern Hemisphere since 1850

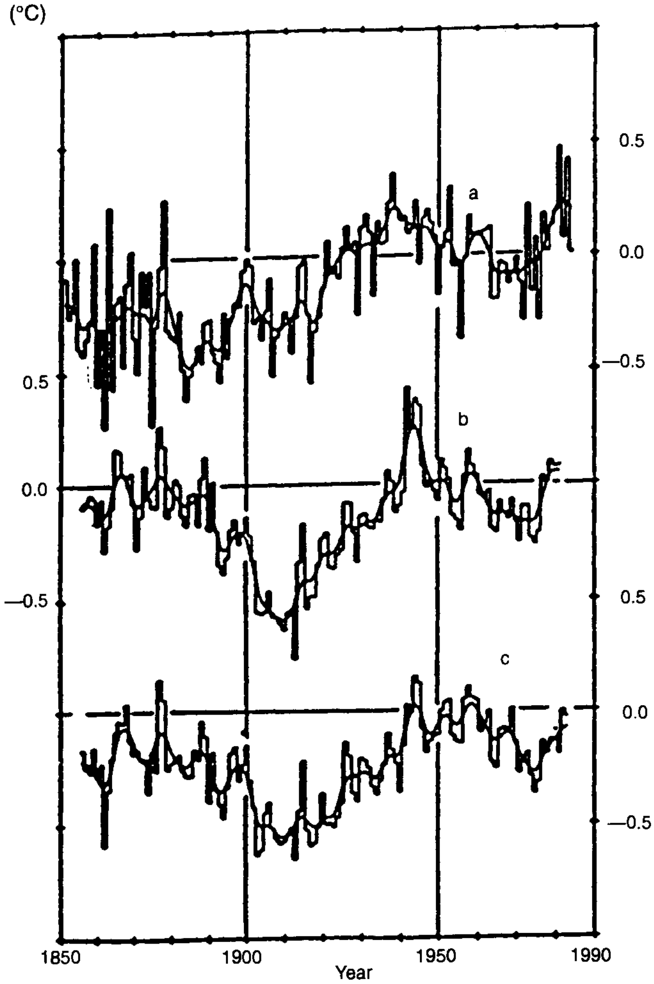
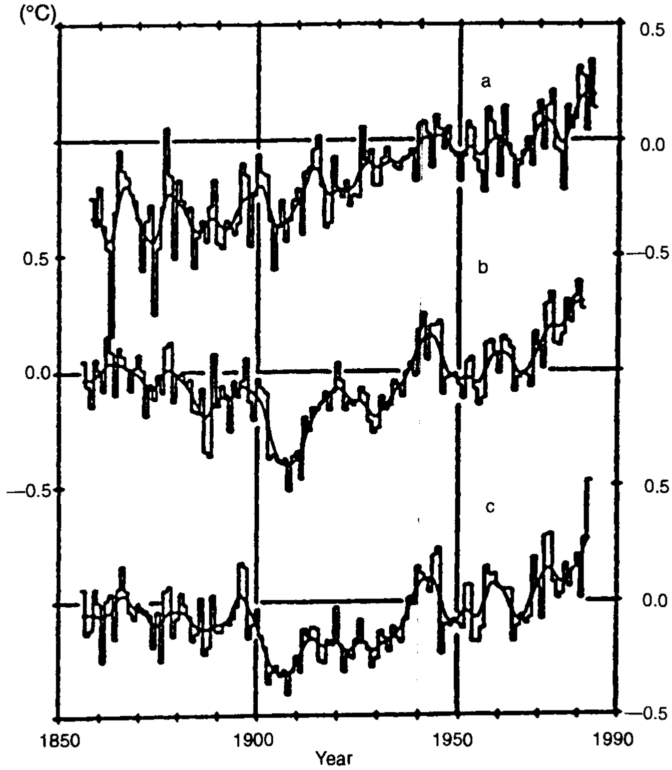


FIGURE 1b

Observed temperature trends in the Southern Hemisphere since 1850



Source: *Global Warming, The Rest of the Story*, Jones et al., *Journ. Clim. Appl. Met.*, 1986a.

The temperatures were observed a) over the continents; b) over the oceans; c) of sea surface temperatures. The smoothed curve shows 10-year averages.

not occur until after World War II. And everyone would probably agree that we cannot explain a temperature rise before 1940 by a trace-gas increase after 1940: That would be sheer nonsense.

We now continue our journey through time and must bedazzledly realize that as trace-gases build up in the atmosphere and the greenhouse curve goes up as well, observed temperatures go down (Figure 1). "Well, why shouldn't they?" we ask, because if they went up before 1940, obviously due to natural causes, why shouldn't they go down—also due to natural causes? Temperatures went down about 0.4° until the mid-1970s, whereas the greenhouse should have warmed us by about 0.9° during that time.

The first symptoms of an attenuated greenhouse theory appear. If we wanted to explain the observations in terms of the greenhouse theory, there should have been a natural cooling—without the greenhouse effect—on the order of 0.4°F+0.9°F=1.3°F.

This cooling, due to natural factors over only 30 years, would have been quite large by historical standards, particularly since, as we will see a little later, we can not identify any natural factors which might have caused it.

You will notice that it is somewhat difficult to analyze how the greenhouse effect may have acted and is now acting, since we cannot assess how the natural climatic system would behave *without* trace-gases being present. Clearly, greenhouse proponents could always respond to claims that the warming observed over the last decades is significantly less than predicted by making the counterclaim that there was a *natural* cooling present in the climatic system—veiling the greenhouse effect. While this is theoretically possible, it is nonetheless highly speculative reasoning, and it also seems to contradict what we know about other factors influencing the climatic system over the last 100 years: Most of those factors point to a warming and not to a cooling. Moreover, the hypothetical cooling invoked is slowly but surely becoming improbably large.

We may therefore be justified in rebuffing the contention, "We can observe the warming the models are predicting," on the basis of the following additional points: 1) The bulk of the warming of the last 100 years occurred *before* it could have been caused by the greenhouse effect. 2) The greenhouse theory could only be maintained if a hypothetical, large natural cooling did occur since 1940 which veiled the greenhouse effect.

Let us now continue our journey through time. As we enter the 1980s, the greenhouse proponents get their biggest break yet: The climate warms up rapidly, mostly over the continents, but also over the oceans of the Southern Hemisphere. The 1980s, it turns out, is the warmest decade we have seen on our journey which began in the middle of last century, with 1990, 1988, 1987, 1983, 1989 and 1981 being the warmest years. Now we finally have it, the irrefutable evidence that the greenhouse has arrived. Or so they claim. Now, after dissecting the first claim, i.e., that the warming seen between 1880 and 1980 is compatible with climatic model predictions, we will take a closer look at the second major claim, that the warmth of the 1980s must be seen, if not as the final proof of the greenhouse effect, then as a very strong piece of circumstantial evidence in its favor.

Warming in the wrong places?

Let us now take a closer look at those last 10 to 15 years which have brought us that warmth and which were, climatically speaking, quite remarkable. If we took a close enough look at the temperature record to see individual years, we would notice that some spectacular changes must have taken place between the years 1976 and 1977, because temperatures jumped upward by 0.6°F, reversing the downward trend of earlier decades, particularly in the Northern Hemisphere. Subsequently, temperatures stayed up and rose even further. If we now attempt to track down the sudden appearance of renewed "global" warming, it does not take long to find the culprit: The tropical Pacific.

Here we find the famous El Niño events. In an El Niño, large amounts of warm water (82-84°F) normally stored in the western Pacific flow eastward and may even reach the west coast of South America, where they very often arrive right around Christmas time—thus the name El Niño, Spanish for the child (of God)—displacing waters which are normally cool (about 76°F). Above that warm water, intense flows of heat and moisture into the atmosphere set in, causing rains in the wrong places and shifts in wind patterns almost everywhere around the world. One particular phenomenon is the spread of warmth around the tropical belt; that means not only that an El Niño year is a warm year over the tropical Pacific, but also over the entire tropics. The tropics themselves, however, if counted out to latitude 30°, comprise fully half of the surface area of the world. In other words, if it gets warm in the tropics, the rest of the world may stay normal, or even colder than normal, but it may still be warmer than normal on a "global" average. This is precisely what happened during the last 10 to 15 years.

It is no surprise anymore to learn that the "unusually warm years" of 1983, 1987, and partially 1988 were El Niño years. If we now look at the temperature distribution in the Northern Hemisphere between 1976 and 1990, differentiated by tropics (0°-30°) and extratropics (30°-90°), and if we consider a composite temperature trend over land and oceans, we find that the extratropics have been below normal *almost every year*. This is particularly visible in 1987, one of the record warm years (see **Table 1**). This is not as visible if we only consider land-based temperatures. Here there was warming even in mid-latitudes **(Figure 2)**—counterbalanced by cooling over the oceans. Once again we realize how important it is to look at the entire temperature record, land *and* oceans, if we wish to arrive at an observational record which can be used for comparisons with greenhouse predicted temperature changes. In the Southern Hemisphere, however, there has been a more uniform warming, so that in reality we have to speak of a divergent trend between the Southern Hemisphere and the Northern Hemisphere, especially in the 30 years before the mid-1970s. On the other hand, if we consider land-based trends over the Southern Hemisphere, a look at the globe tells us that most of the land mass of the Southern Hemisphere is within 30-35° of the equator, so that we may count most of the Southern Hemisphere land mass as low latitude or tropical. Scientists have now found out, very much in line with what we said above, that warmth over the Southern Hemisphere land mass is very highly correlated with warmth in the tropics, and therefore warmth in the Southern Hemisphere (land mass) is to a very large extent a reflection of warmth in the tropics.

Nonetheless, there has been significant warming even over the Southern Hemisphere oceans in recent decades (see Figure 1b), but not too much can be said about temperatures there in mid-latitudes. It remains doubtful, however, whether the Southern Hemisphere temperature rise can be explained in terms of the greenhouse theory, because the oceans, due to their thermal inertia, are least expected to manifest a greenhouse effect. Some scientists think that sulfur emissions from fossil fuel-burning, which occur mostly in the Northern Hemisphere, might be responsible for the relative cooling of the Northern Hemisphere. Indeed, sulfur, which provides for cloud condensation nuclei (CCN), might have been responsible for some of the cooling over the oceans, but it probably has to be ruled out as a cause for cooling over the continents. Furthermore, sulfate aerosol, which forms from sulfur dioxide emitted into the atmosphere, may also have contributed to a cooling, at least partially offsetting the greenhouse effect.

However, sulfur emissions in the industrialized countries increased only relatively slowly after World War II, peaked

TABLE 1

Northern hemispheric surface temperature departures between 1976 and 1989

(The base period is 1951-60)

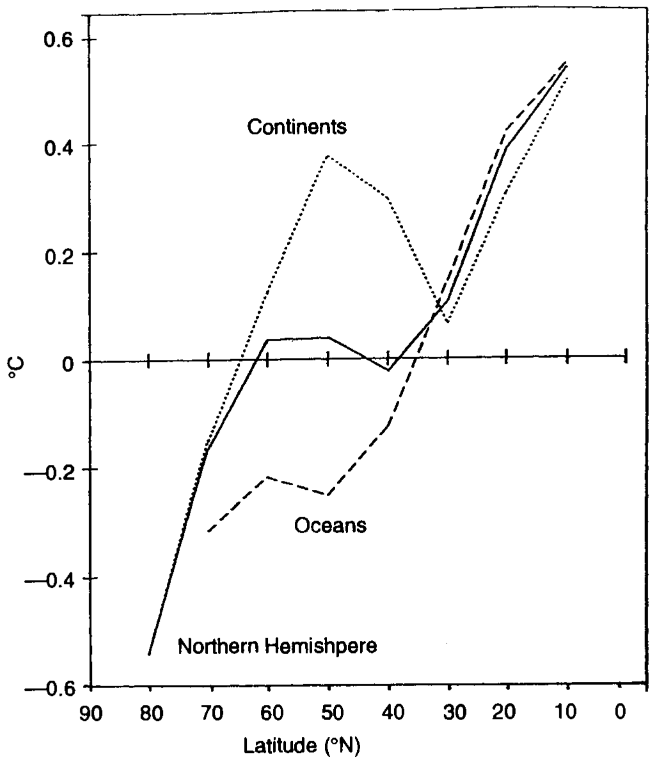
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Tropical region														
0-30°N	−0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.0	0.2	0.6	0.4	0.1
Extra-tropical region														
30-90°N	−0.4	0.0	−0.2	−0.2	−0.1	0.5	−0.2	0.1	−0.1	−0.2	0.0	−0.2	0.2	0.2

Source: *Global Warming, The Rest of the Story;* Institute of Meteorology, Free University of Berlin.

FIGURE 2

Temperature departures in the troposphere of the Northern Hemisphere averaged between 1977-86 as a function of latitude

(Base period is 1951-66; altitude is 0-9/km above sea level)



Source: *Global Warming, The Rest of the Story,* after Weber, *Int. Journ. Climat.,* 1990.

in the 1960s, and have been declining ever since, even though global emissions went up. Most of the increase occurred over Asia. Since sulfur compounds have an atmospheric residence time limited to only a few days (contrary to greenhouse gases), any cooling effects should essentially have been confined to the source regions and some distance downwind. In addition, if the sulfur argument holds, sulfur emissions should have caused a pronounced cooling in the Northern Hemisphere during the first half of the century, when they went up from close to zero to half their present value. Since we know that a large warming did in fact occur—instead of a cooling—the sulfur-climate relationship remains somewhat speculative at this point.

Now we realize that the pattern of the most recent warming is certainly not the one we would expect from climate model predictions: i.e., large warming at high latitudes and small warming at low latitudes. The recently observed pattern is the contrary (see Table 1). At high latitudes, there is even some continued regional cooling, which runs completely counter to model predictions.

However, just to show you how complicated things are, we thereby implicitly assume that the so-called transient response, i.e., the way climate evolves as trace-gases slowly build up in the atmosphere, is the same as the equilibrium response, but at a smaller amplitude. As some recent modeling results suggest, this may not be the case. Due to complex feedback mechanisms between the oceans and the atmosphere, the geographical pattern of the warming may be different from the equilibrium warming over decades, and in fact it may even cool at high latitudes in the Northern Hemisphere, and therefore create a warming pattern resembling the observed one.

At this point, it is too early to view the results of the more advanced transient models with any confidence, which are in fact coupled to an ocean model, but still show large differences between each other. In any event, the cause of the recent warmth must then be found in the tropics and is partially, if not largely, related to the repeated occurrence of the El Niño phenomenon. There is currently no theory which would relate an increase in occurrences of the El Niño phenomenon to the greenhouse effect.

Moreover, the additional, man-made greenhouse effect should be least effective in the tropics because of the large overlap between water vapor and carbon dioxide there, which is why we expect the smallest warming in the tropics—at least in lower atmospheric layers. This might not be the case with other greenhouse gases, however, which are active in different spectral regions.

Therefore, unless we are prepared to believe that the most recent warming is a greenhouse warming essentially restricted to the tropics, which appears to contradict the model predictions, we must reject the claim that the warmth of the 1980s is a proof of the greenhouse theory, or at best a strong piece of circumstantial evidence in its favor, for the following reasons: 1) On a formal basis, a spike in the temperature curve is no proof of a climatic change. 2) The pattern of the warming is completely different from that predicted by the models, unless the warming pattern of the transient response is very much different from the equilibrium response. 3) More fundamentally, the warming must very likely be attributed to causes other than the greenhouse effect.

Summer recess for the greenhouse effect

So far we have only looked at the trend of annual average temperatures, but we have not yet paid any attention to the intra-annual pattern of the warming of the past 100 years; in other words, we have not analyzed the question of whether the warming occurred more or less uniformly, distributed throughout the year, or whether it was concentrated in one or several particular seasons.

In Part 1 (*EIR*, Jan. 10), we established that over the U.S., the warming expected for the summer months was almost as large as for winter, whereas in the global average, wintertime warming is supposed to be noticeably larger than summertime warming. The seasonal distribution of the warming is of particular relevance, since almost all of the envisioned negative impacts thought to be associated with global warming are tied to *summertime* warming. Clearly, one would expect the increase of an average summertime maximum temperature, from 85°F to 92°F, to have some kind of an adverse impact on agriculture and human comfort. On the other hand, it is not likely that many people in Minnesota would complain if the average wintertime minimum went up from −10°F to −3°F.

Let us therefore take a look at the seasonal pattern of the warming of the last 140 years. Much to our surprise, we see that almost all the warming in the land-based record is concentrated in the winter months and no warming whatsoever has occurred in summer. This is true not only on a global (or Northern Hemisphere) average, but also over the U.S., where we must in fact acknowledge that it has been cooling over the last 60 years. The same is true for other areas of the mid-latitudes, for instance Europe. In Europe, no increase in summer temperatures can be deduced even from long-term thermometer records reaching back to the middle of the 18th century. This is all the more surprising since the greenhouse community is quite sure that a greenhouse warming should first be detectable in mid-latitudes in summer. But the warming we did observe has largely been a specific winter warming, whereas summer temperatures did not rise at all. This obviously raises questions as to the underlying causes of that warming, restricted to the winter half of the year: The greenhouse effect does not take a summer recess.

Everybody's favorite: the drought of 1988

Now let us direct our attention to the third claim, the one that really had a big impact on public debate in the U.S.: The drought of 1988. There have been a number of claims that the drought of '88 was, if not the final proof, then a very strong piece of circumstantial evidence in favor of the greenhouse theory, much like the warming of the 1980s. To make one thing clear right away: To everybody who could read a climatological data table, let alone to climatologists themselves, this was a hair-raising statement, and climatologists did not know whether to laugh or to disbelievingly bury their faces in their hands—but the public and media alike loved it anyway.

However, as we have seen, the frequency and severity of droughts is expected to increase in a greenhouse scenario—which is the basis of the claims regarding the 1988 drought. Let us then analyze the drought from two different angles: 1) the historical climatological perspective and, 2) the causal perspective.

1) The historical climatological perspective. Believe it or not, bad droughts are a normal part of U.S. climate in general, and of the Great Plains in particular.

The big droughts did occur in the 1930s (the infamous Dust Bowl years, remember *The Grapes of Wrath?*) and the 1950s, or more precisely, 1934-36 and 1952-54.

The period following 1954 was conspicuously devoid of any major droughts and notably the 1970s and '80s were characterized by a long string of predominantly cool and moist summers, interrupted only by a drought over the southern plains in 1980 and a drought in 1983, but there have been mainly cool and moist summers for decades, particularly over the nation's Midwest and the corn belt. Nobody was yelling "greenhouse!" then.

But when 1988 arrived, and the country's Midwest was hit by the first major drought in 34 years, it *had* to be the greenhouse effect. It is hard to imagine that even a dyed-in-the-wool greenhouse proponent seriously believed that! Obviously, from the climatic history of the U.S., there is no indication whatsoever that climatic changes of the type predicted by the models have occurred in summer over the past decades, and that the drought of '88, however extreme it was, can be seen as anything but a fluke of natural variability in the workings of the climatic system.

Midwesterners may indeed have second thoughts about those claims now that they have had to suffer through, or possibly enjoy, a predominantly cool and cloudy summer in 1989 and 1990, very much unlike the one of 1988.

2) We will now consider the drought from the causal

perspective. According to model calculations, droughts should increase as a result of the general rise in summer temperatures under a scenario of relatively constant precipitation, which has not materialized over the U.S. so far. Hence, there should have been (and should be in the future) an increasing frequency of those situations, where, due to increasing evaporation, soil dryness increases simply as a result of higher temperatures, but not because of concurrent changes in the atmospheric circulation pattern.

However, scientists have been able to show that the drought of '88 was not due to a general rise of global temperatures, but instead to an unusual change in atmospheric circulation patterns over and around the North American continent, which was temporary in nature and has since been reversed. The major feature of that change was the very persistent recurrence of high pressure areas over the central U.S. and the hot, dry, and sunny weather commonly associated with high-pressure areas in the summertime. Any greenhouse effect, if it was (hypothetically) present, may only have caused an additional warming, increasing a high [temperature] from 90° to maybe 91°, if that much, but it was certainly not a fundamental or even minor cause of the drought.

We must therefore reject the contention that the occurrence of the 1988 drought was in any way related to the model-computed greenhouse effect for the following reasons:

1) The drought was due to a temporary, anomalous change in atmospheric circulation patterns over North America.

2) Climatic history shows that droughts are part of normal climate variations in the United States. The first major drought in 34 years cannot be taken as a sign of the greenhouse effect if the preceding 34 years were conspicuously devoid of any major droughts.

3) Moreover, long-term trends of U.S. summer temperature show no indication whatsoever of the warming that the models predict. Instead, there appears to be a cooling over the past six decades, which clearly contradicts model predictions.

We may add here that, while the U.S. was hit by one of the worst droughts ever, other regions of the world, e.g. Britain, recorded one of the wettest summers on record, and in northern Japan there was widespread failure of the rice crop—caused by an unusually cool and rainy summer.

Looking for clues

We have now analyzed the global temperature record, differentiated by annual and seasonal averages, and we have concluded that, in the global record, we only see a fraction of the modeled temperature rise since the middle of last century, and furthermore that there has been no temperature increase at all in the summer, the season a greenhouse effect should be first detectable. More surprisingly, in the U.S., there has actually been cooling over the last 60 years. Let us now search the climatic record for further clues for—or against—the greenhouse effect on a worldwide basis. We will do this by looking at some of the major changes thought to have been caused by a greenhouse warming and comparing predictions with observations. In doing this, we assume that the pattern of the transient response of climate to increasing trace-gases is similar to the equilibrium response, but at a lesser magnitude, as is done in almost every major study devoted to the subject. However, as we cautioned earlier, that may not be correct, and the transient response may be different from the equilibrium response; therefore some of the clues identified in favor of the greenhouse effect may turn out to be no clues, and conversely, some of the clues rejected may turn out to be evidence in favor of the greenhouse theory after all. It appears as if we are treading on treacherous, highly speculative ground.

We already identified some of those major changes, and we will now direct our attention to them. Let us then look at: 1) the precipitation record; 2) the sea level record; 3) extreme weather and climate events.

1) The precipitation record. According to climate model predictions, precipitation worldwide should increase under a scenario of rising trace-gas levels and the warming caused by it, basically as a result of increased evaporation from water and land surfaces and the attendant increase of atmospheric water vapor content. Those increases should be most pronounced poleward of 35° of latitude, while in the subtropical belt, no major changes are expected.

Clearly then, even if one observed an increase of precipitation, it would not be an independent proof of the greenhouse effect, since, in the model calculations, such an increase would principally be tied to a warming of the oceans, which had to occur before or simultaneously with the increase in precipitation.

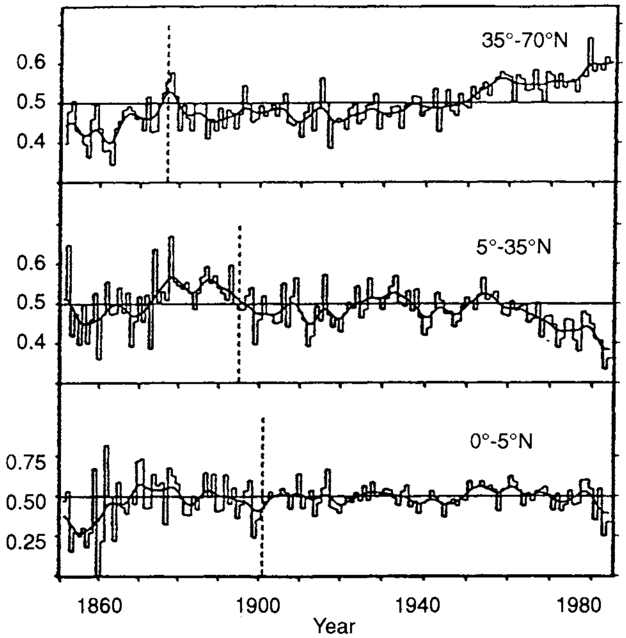
Other than increasing atmospheric water vapor, an increase in precipitation could also be brought about by an intensification of precipitation-generating processes, as for instance the strength and frequency of rain-bearing storm systems in mid-latitudes.

Looking at the precipitation record, (see **Figure 3**) we realize that precipitation in mid-latitudes has indeed increased during the last four decades, just as the models ordered. Could this be a proof of the greenhouse effect then?

Well, certainly not, because even if the increase were tied to temperature, it would only be an echo-effect of the temperature record, which we have already shown to be only marginally related to the greenhouse effect.

But there is more. Since the 1950s, the oceans in mid-latitudes have been going through a cooling phase, which covers the Pacific north of about 25° and the Atlantic north of about 40° latitude. Hence, the increased precipitation in mid-latitudes cannot be the result of increased evaporation

FIGURE 3
Trends of precipitation in lower and mid-latitudes of the Northern Hemisphere since 1850



Source: *Global Warming, The Rest of the Story;* after Bradley, et al. 1987.

Shown is the relative variation where values below 0.5 indicate precipation amounts below long-term means and values above 0.5 indicate amounts above long-term means.

from warmer mid-latitude oceans, but must be attributed to different factors.

One of those factors may indeed be the increased frequency and intensity of storm systems alluded to above, which would be accompanied by intensified precipitation generating mechanisms. Why? Because the intensity and frequency of storm systems in mid-latitudes is generally related to the temperature contrast between the equator and the pole: The stronger the contrast (or gradient), the more intense the storm systems become. Now, this temperature contrast has intensified in recent decades, particularly over the oceans, the main playground of most major storm systems. The intensification is a result of the lop-sided warming we have witnessed in recent decades (see Figure 2): warming in low latitudes and cooling in high latitudes. As a result, storm systems grew more intense on the average and may have yielded more precipitation. It may be noted in addition that, according to the models, no major change in the equator to pole temperature gradient was expected, and that the observed intensification of the gradient—in conjunction with the pattern of the most recent warming itself—runs counter to climate model predictions. We may therefore conclude that an increase of observed precipitation in mid-latitudes of the Northern Hemisphere can not be explained in terms of the greenhouse effect, and that the actual, underlying causes of the increase in precipitation point against the greenhouse effect as a causal factor. Despite the fact that, according to the models, no decrease of precipitation is expected in the subtropical belt, it has been frequently argued that a decrease observed there (see Figure 3), which is particularly prominent over the Sahel region of Africa, is due to the greenhouse effect. But much to the chagrin of greenhouse proponents, the beginning of drying in that region is coincident with the general global *cooling,* which began in the 1950s and which was most pronounced in the Northern Hemisphere.

Along with that cooling, there was a general slight shift of the atmospheric circulation belts to the south, which caused the Sahel (about 20°N) to be more frequently under the influence of the subtropical high pressure belt and dry northerly flow, instead of the moist southerly flow from equatorial Africa. The northern limit of the moist southerly flow has receded steadily.

That shift to the south may partially be a reflection of the southward shift of the "thermal center of gravity" towards the Southern Hemisphere we mentioned earlier, and which can hardly be explained in terms of the greenhouse theory, because the Southern Hemisphere is mostly covered by water, where we would least expect to see a greenhouse effect.

2) Rising sea levels. Rising sea levels are one of the major causes of concern associated with the greenhouse effect. Indeed, some increase in sea level has been observed during this century and has been interpreted as a piece of evidence in favor of the greenhouse theory.

We first of all recall that rising sea levels (see Part 2) are thought to result mainly from a warming and thermal expansion of the oceans, and even if observed, cannot be viewed as an independent piece of evidence, since in that case they would be an echo-effect of the rising temperature, much the same as with precipitation.

We then recall secondly, that the oceans in mid-latitudes of the Northern Hemisphere, where most of the sea level gauges are located, have cooled in recent decades, so that, on the face of it, it is hard to imagine how cooling oceans may be associated with rising sea levels, in terms of the greenhouse theory.

Furthermore, and most importantly, much of the sea level increase has been deduced for a time period when sea surface temperatures (SSTs) *did* increase, namely from about 1910 to 1970.

However, we recall from Figure 1 that SSTs did decrease drastically between 1890 and 1905, so that it is somewhat suspect to restrict an analysis to only that time interval where one might expect to arrive at the desired result: Namely, a parallel course between rising SSTs and rising sea levels. What kind of sea level trends one would deduce if the analysis were extended back to the time before 1890, when SSTs were about as warm as they are today, is an open question.

Furthermore, since most of the SST rise (and possibly the associated sea level rise) occurred in the first half of this century, it cannot be blamed on the greenhouse effect anyway for reasons stated earlier.

In addition, the spatial distribution and accuracy of sea level gauges is severely limited prior to 1900; in essence, very few data from the North East Atlantic and the Baltic Sea are considered accurate.

After making allowance for tectonic movements of the Earth's crust, i.e. the natural rising and sinking of the Earth's surface, which may falsely suggest either a rising or sinking sea level, some researchers recently concluded that the observed sea level rise can be attributed only in a small part to oceanic warming and should rather be viewed largely as a result of glacial melt.

However, we know that at least in high latitudes of the Northern Hemisphere such a melt-off was highly unlikely in recent decades, because it was cooling there.

There has been some warming at high latitudes of the Southern Hemisphere in recent decades, which may have caused some glacial melt there. Yet we know from Part 2 that the net effect of a small warming around Antarctica is not a loss of ice, but a gain. It is therefore difficult to imagine that even the observed warming at high latitudes in the Southern Hemisphere did make a contribution to a sea level rise.

Furthermore, at least over the Alps, there has been, if anything, an advance of glaciers since the mid-1960s and not a retreat, which would be required for an increase in melt water made available to the oceans.

Again, the bulk of the observed glacial melt did occur in the first half of this century, and, as we have repeatedly pointed out before, all those processes—be they warming seas, retreating glaciers, rising sea levels, or the warming in general—insofar as they occurred in the first half of this century, *cannot be ascribed to the greenhouse effect* because they occurred *before* trace-gas concentrations went up so rapidly.

We must therefore conclude that the sea-level record is no more of a factor supporting the greenhouse theory than the temperature record itself.

3) Extreme events. One favorite sport of the media and greenhouse proponents alike is to link the occurrence of extreme weather and climate events to the greenhouse effect. In fact, it appears to be standard procedure nowadays, that whenever some extraordinary event occurs, it is immediately blamed on the greenhouse effect.

In doing so, a screening procedure is usually applied, which picks out only those extremes which fit the greenhouse bill, while the others are left out.

The same goes, by the way, for a number of scientific publications, all designed to "prove" the greenhouse effect, thereby falling victim to what is called "scenario fulfillment"; i.e. "the inadvertent distortion of data flow in a subconscious attempt to make them fit a *preconceived* scenario."

Needless to say, this is highly unscientific. But obviously, some researchers fail to realize that the point at issue is not whether data can be explained by—or are not contradictory to—the greenhouse theory, but rather to ask if that is the only and the *best* possible explanation, because only if other explanations can be excluded, or rendered unlikely, is it justified to speak of a relationship between some observed phenomenon and the greenhouse effect.

Here is an area where an upgrading of proper and defensible scientific attitude is badly needed, not to mention the media's attitude.

If we take as examples for such extreme events the number of days with temperatures above 90°F, the number of days with rainfall above 5 inches, or the number of hurricanes in a hurricane season and so forth, we must obviously apply the same criteria to the extreme events which we have applied to temperature or precipitation alone. In other words, we must ask, has the frequency and/or severity of those events changed over a climatically relevant time scale, which is about 30 years. We cannot, as we have shown above, draw the conclusion that one particularly heavy rainfall, drought, storm, or severe winter constitutes a climate change if it is only an isolated event; or even if it occurs in a run of years, if that run of years is short compared to a climatic base period, or is replaced by a run of years of countervailing character. Nothing in climatology is more nonsensical than the extrapolation of a short-term trend into a long-term trend.

In the summer of 1987, Chicago (and other areas of the Great Plains) was hit by several intense rainstorms, which produced close to 10 inches of precipitation within 24 hours and caused severe flooding. If anyone had then concluded that we are now headed for rainy summers, the drought of '88 should have taught him a lesson. If anyone had concluded in the summer of '88 that we are now headed for hot summers, the cool summer of 1989 would again have taught him the same lesson: Never extrapolate a short-term trend into the future.

As far as extreme events are concerned, we must therefore conclude that we can speak of a climate change only if they occur in an increased frequency over a climatically relevant time scale. If they do not, they are climatically, and in terms of the greenhouse theory, meaningless—particularly if they are accompanied by climatic events of opposite character in other parts of the world, which would be contradictory to the greenhouse theory anyway.

There are no indications that the warming climate of the last 100 years has been accompanied by an increase in extreme events; the opposite seems much more likely. From all we know, it appears as if the colder episodes in former centuries were the ones with many more extremes in climate, while the relatively warm climate of the 20th century has been mostly benign.