What makes Anthropogenic Climate Change a Social Problem?

Hans von Storch

10 April 1996, Stockholm

Prologue

Anthropogenic Climate Change is real

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Anthropogenic Climate Change is real

- The globally averaged near-surface temperature has risen about 0.7 C in the past 100 years.
- The rate of warming was largest in the recent years and decades.
- The spatial pattern and the intensity of the observed warming is consistent with the response of climate models to increasing greenhouse gas concentrations.

Prologue

Anthropogenic Climate Change is real

- The rate of warming in the past 20 years is larger than plausible rates caused by the always present natural climate variability.
- Caveat: The estimation of the level of natural variability is subject to large uncertainties.
- Conclusion: It is very likely that the recently observed warming trends reflect at least partly the "global warming" envisaged by S. Arrhenius and modern climate models.

Climate Change in the Past 100 Years - internal or external?

- **The homogenized analyses of near-surface temperature** indicate an increase of this temperature in the past 100 years.
- **To asses whether this increase is natural or not** a "detection variable" is formed, which is the projection of the analysed ("observed") temperature fields on the warming pattern simulated by a climate model.
- **The observed warming is declared "inconsistent with natural variability"** (= signal has an external source) if the detection variable is outside the 95% confidence band of natural variability.
- **The 95% confidence band of natural variability** is estimated from observed data (problem: contamination by the signal) or from climate model runs (problem: model might be wrong)
- **This procedure leads to the decision**

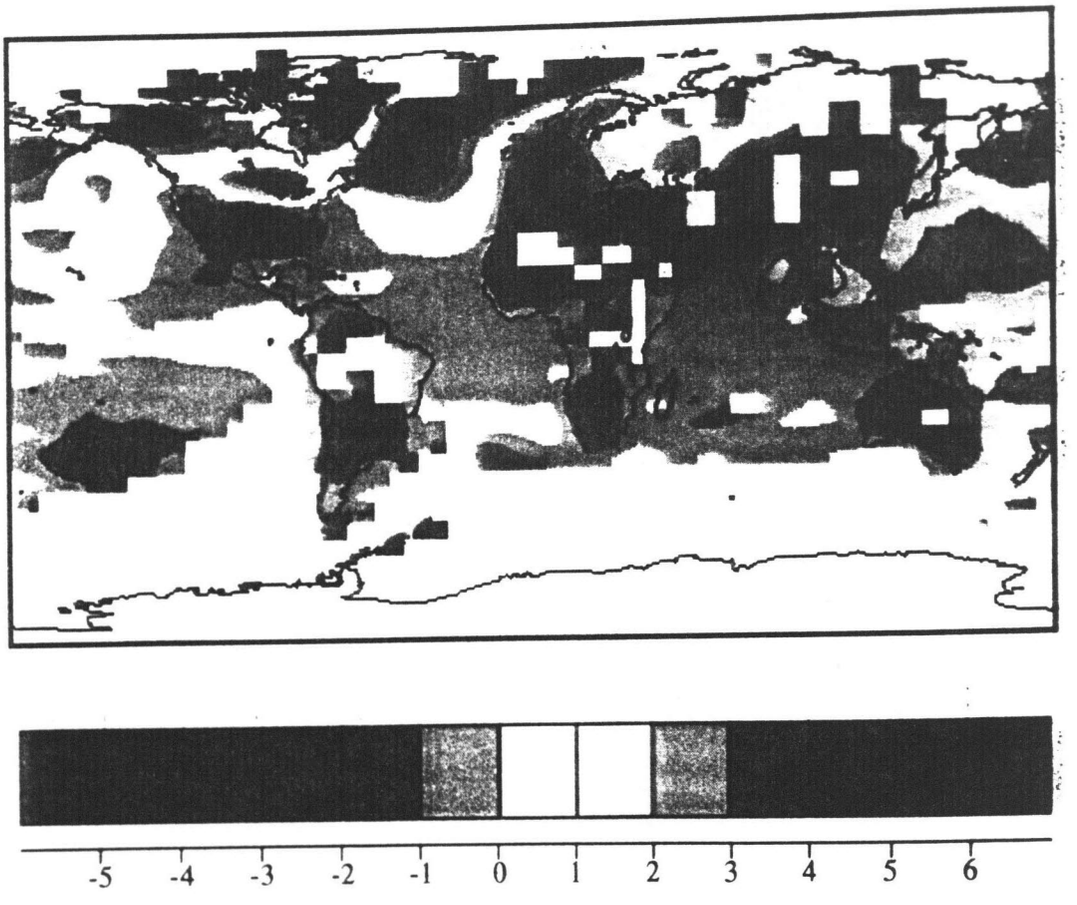
  the recent warming trend is NOT related to internal dynamics.

  Risk: $< 5\%$ -
  provided that the climate variability is correctedly estimated.

For details, see Hegerl et al. (1994)

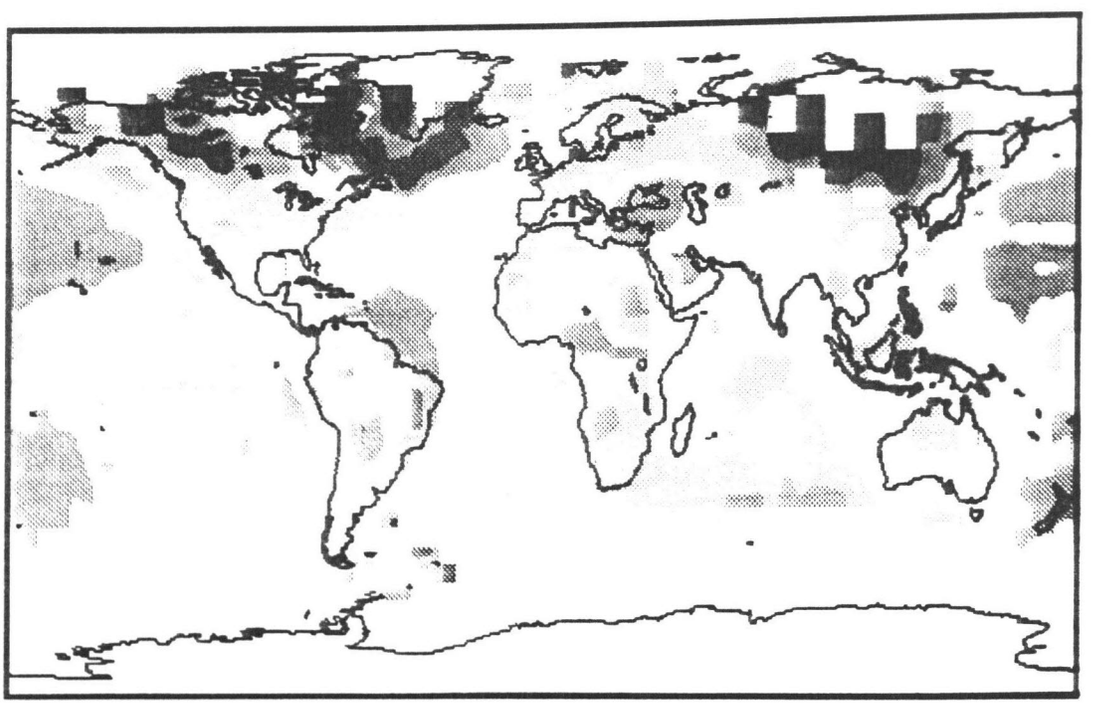
Optimal fingerprint for 30-year trends

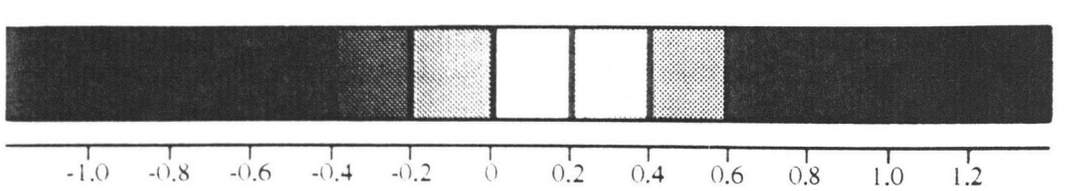
(data: 1000 yrs ECHAM/LSG; space: 8 EOFs „EIN")



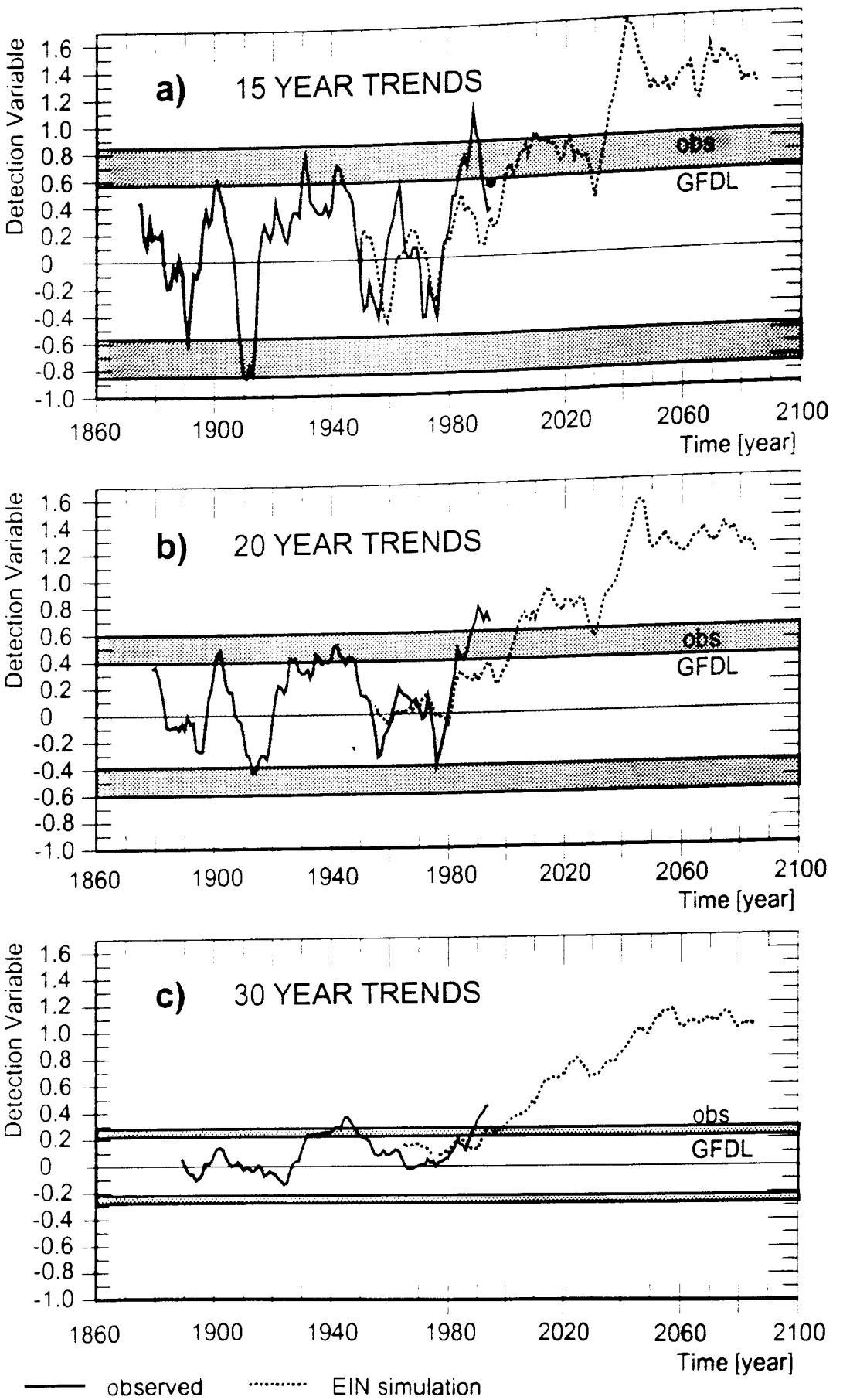
Observed 30-Year Trends: 1965-1994 [C/dec]

Data by Jones + Briffa





RESULTS FOR THE OPTIMAL FINGERPRINT (opt. weight 1000 yrs ECHAM/CSG)



075GCHb ds4 Gabi Hegerl

So what?

Climate variations
as a physical process
are socially irrelevant.

Only the impact of
climate variations
matter.

After the confirmation of the global warming hypothesis, climate impact research becomes a key social and political advising discipline.

How influences, or even determines, climate and climate change the performance of

- natural and managed eco systems?
- economic and social structures?

First question:

Is climate impact research a new scientific discipline?

Climate impact research is pursued for at least 200 years

- Williamson (1770) identifes an improvement of the climate of the north american colonies because of the settler's cultivation of land.

- Brueckner (1890) analyses climate variations, distinguishes between anthropogenic effects (deforestation) and natural variations (solar effects).
  Governmental and parliamentary commissions consider "climate policies".

History of climate impact research

- Brueckner (1915) suggests a link between climate variations and social evolutions (emigration to the US, changing balances of international powers).
- Huntington (1925) publishes his "climate hypothesis of ~~climate~~ civilisation" - the formation of civilisations requires favourable climatic conditions (variable weather mainly because of passing storms, not too large annual thermal variations).
- Beck (1993) suggests a deterministic link between the appearance of European fascism and climatic factors.

An Attempt to account for the CHANGE of CLIMATE, which has been obſerved in the Middle Colonies in North-America.

By HUGH WILLIAMSON, *M. D.*

Read before the Society, Auguſt 17th, 1770.

IT is generally remarked by people who have reſided long in Pennſylvania and the neighbouring Colonies, that within the laſt forty or fifty years there has been a very obſervable Change of Climate, that our winters are not ſo intenſely cold, nor our ſummers ſo diſagreeably warm as they have been.

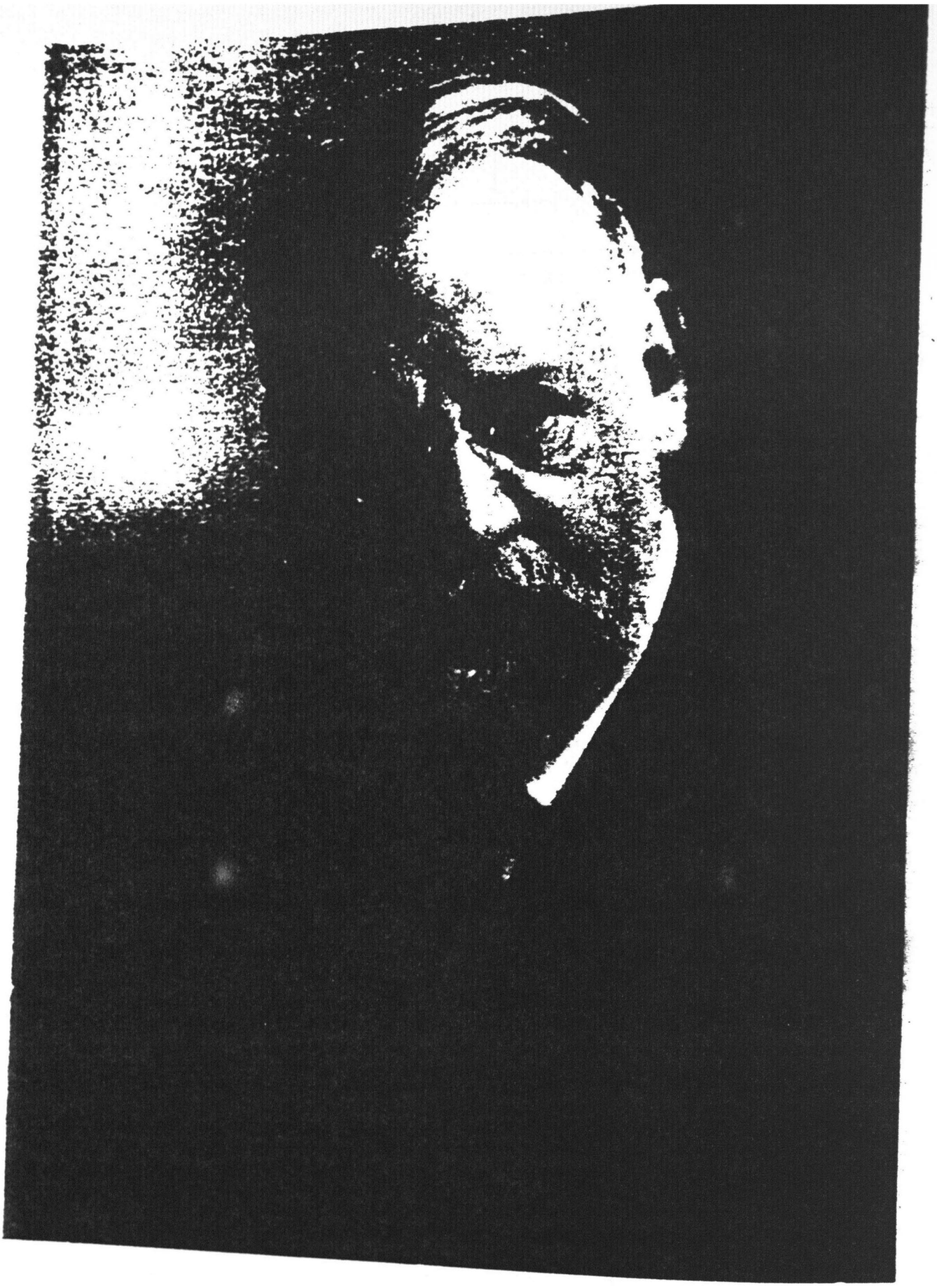
THAT we may be enabled to account for theſe phœnomena it will be neceſſary to take a tranſient view of the general cauſe of winds, and the remarkable difference of heat and cold, that is obſerved in different countries under the ſame parallels.

THO' the Sun is doubtleſs the general ſource of heat, yet we obſerve that countries are not heated in proportion to their diſtance from the Sun, nor even in proportion to their diſtance from the Equator. The inhabitants of the Polar Circles are hardly a perceivable diſtance, not a twenty-thouſandth part farther from the Sun, than thoſe between the Tropics, and yet the former are chilled with perpetual cold, while the others are ſcorched with conſtant heat.

WHEN the rays of the Sun ſtrike the Earth in a perpendicular direction, they will be reflected in the ſame direction on the particles of air through which they have paſſed, and thus increaſe their heat; a greater number of direct rays will alſo ſtrike the Earth in any given ſpace, than when they fall obliquely; therefore, the nearer the direction of the Sun's rays is to a perpendicular with the ſurface of the Earth, the greater cæteris paribus will the heat be. Hence, countries ſhould be colder the nearer they are to the Poles. But,

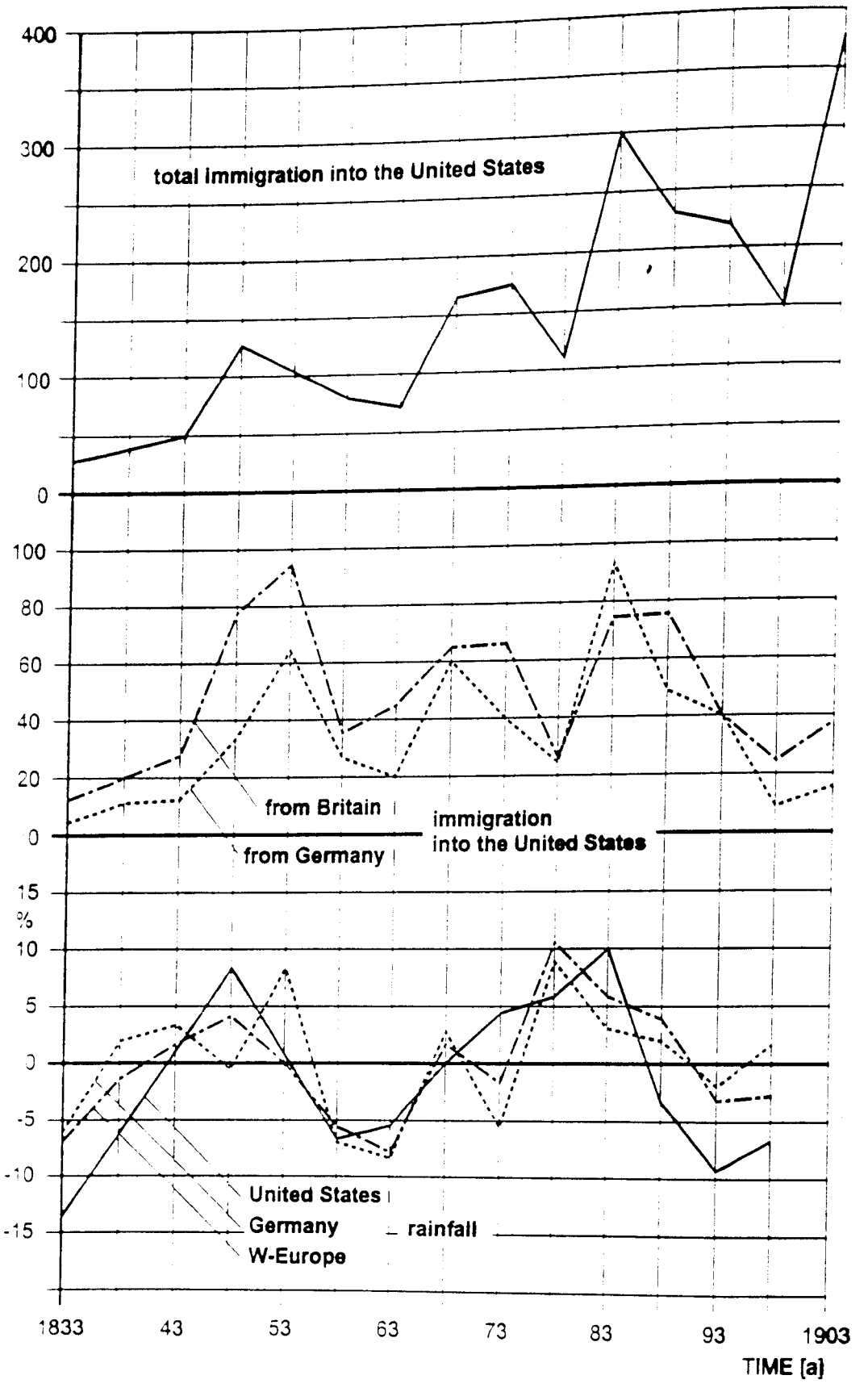
WE obſerve that the air may be heated to a very different legree in different countries, which are in the ſame latitude.

according



EDUARD BRÜCKNER

1862 1927



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CIVILIZATION AND CLIMATE

BY

ELLSWORTH HUNTINGTON

Research Associate in Geography in Yale University

Third Edition, Revised and Rewritten
with Many New Chapters

NEW HAVEN
YALE UNIVERSITY PRESS
LONDON · HUMPHREY MILFORD · OXFORD UNIVERSITY PRESS
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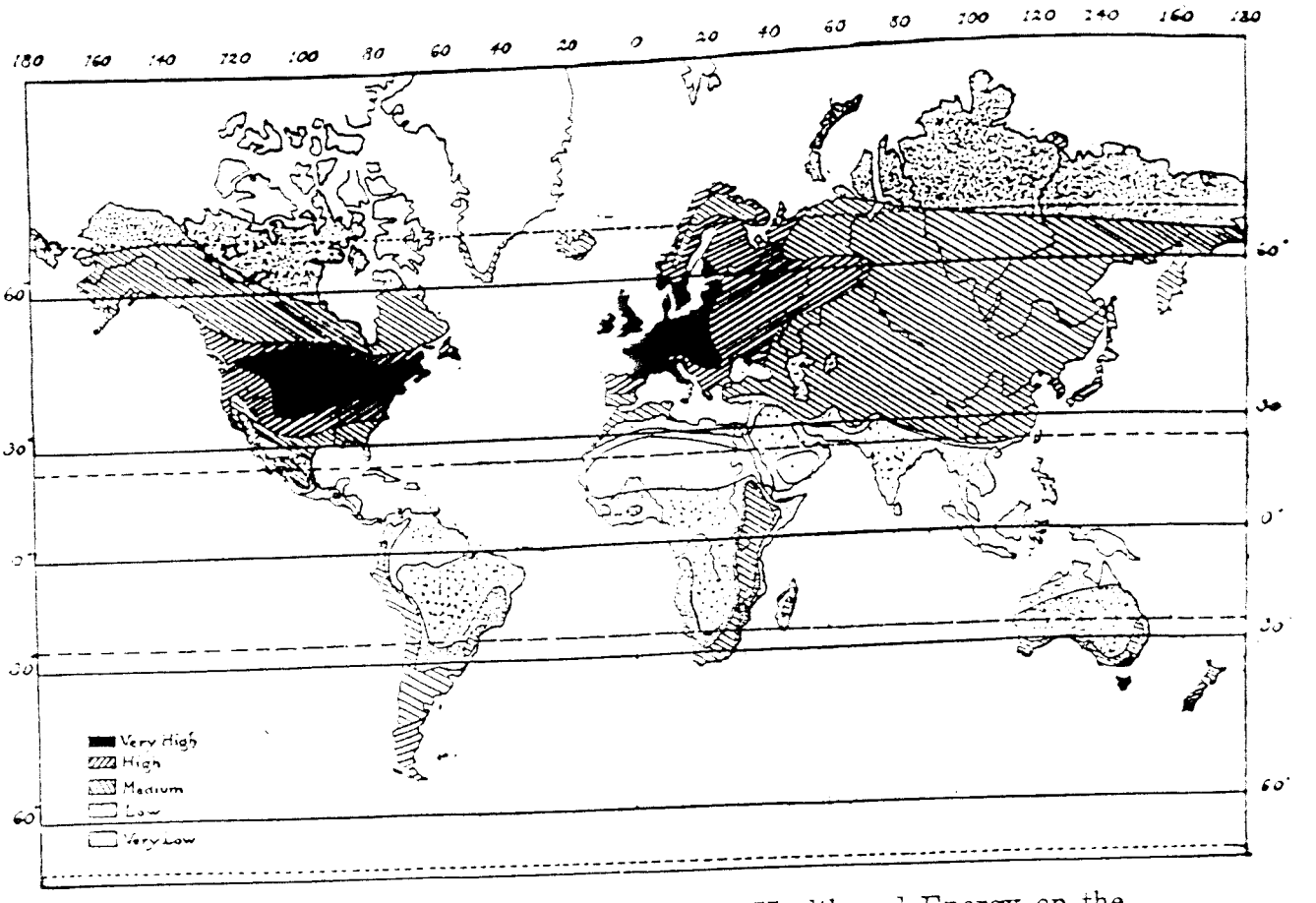

Figure 43. The Distribution of Human Health and Energy on the Basis of Climate

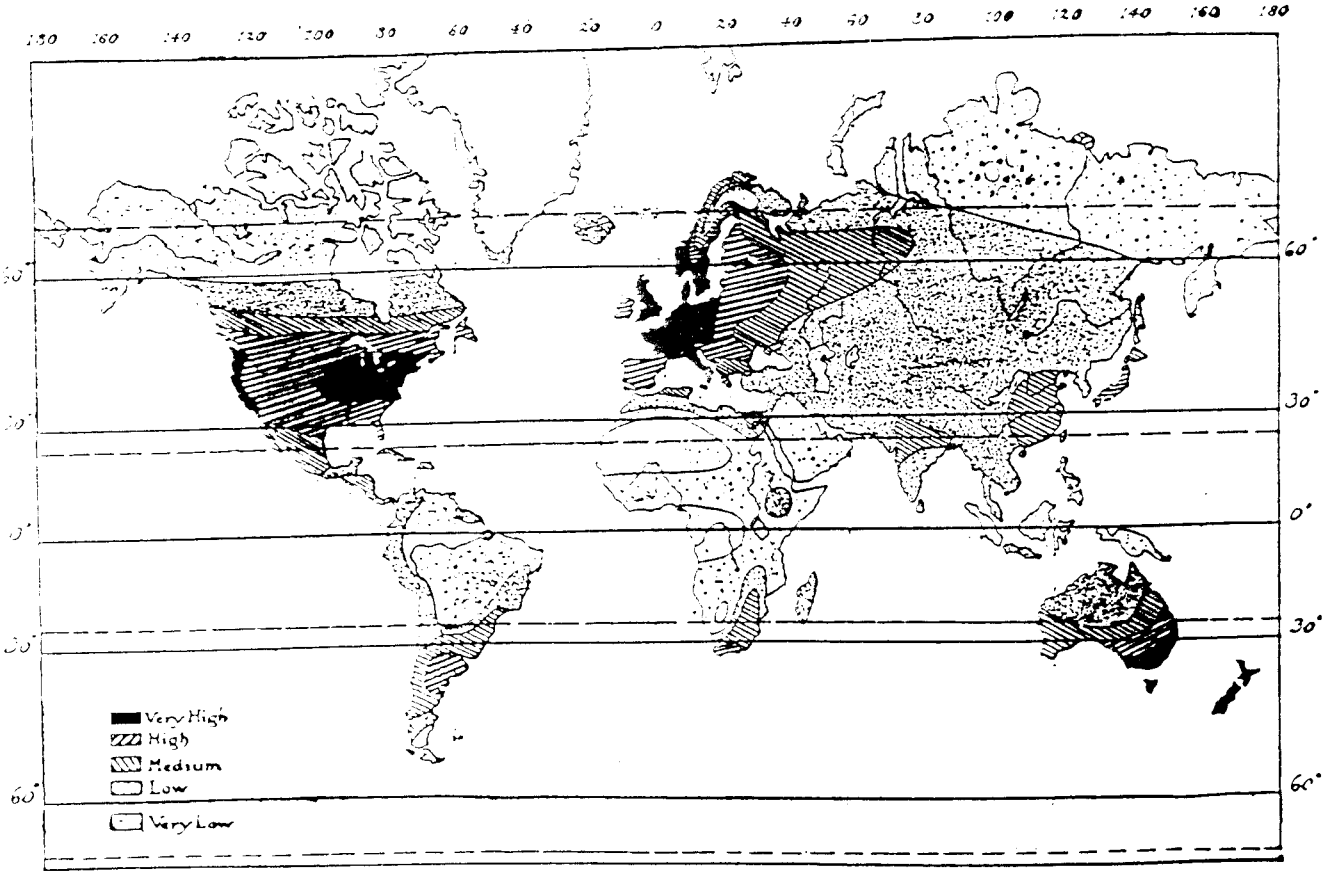

Figure 44. The Distribution of Civilization

Viewpoint

Climate, liberalism and intolerance

Several writers have remarked on apparent correlations between the character of the people of a region and the climate prevailing there; thus Manley (1971) associated the flexible British character with the changeable [illegible] Miller

Conversely, intolerant acts have often been committed by people from areas in mid-latitudes where seasonal temperature extremes are large, as in areas with continental climate. In the 1930s, fascism took over in Spain, Germany, Italy and Austria; all are continental countries with *TD* values generally averaging about 20 deg C (one exception is southern Italy, which has a *TD* of about 15 deg C, but early support for the fascist Mussolini was said to be weak [illegible] (Ency-

Many of the states of the USA which retain capital punishment have *TD* values of over 20 deg C, which is high compared with most other 'western' nations.

It may never be possible to prove absolutely that a mild climate in mid-latitudes helps to foster a tolerant society or that an extreme climate may predispose people towards intolerance. However, the historical record is highly suggestive and if this is recognised it could help to identify potential problem areas in the field of human relations so that timely action can be taken to mitigate threats to peace. There must be no attempt to justify intolerance on climatic grounds but only to note that certain climates may be associated with a predisposition to such conduct. Perhaps the absence of seasonal extremes helps to foster a relaxed attitude because there is no need to make elaborate plans to cope with the rigours of a cold winter and/or a very hot summer. However, where *TD* is large, the pace of life is driven by the seasons, enforcing the discipline of timely preparation for the extremes; here, less relaxed mental attitudes may develop.

Viewpoint

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Climatic Determinism: Popular conclusions

- "Northerners are more effecient since they must work harder and more intelligently to overcome the climatic obstacles".

- "Southeners are less efficient since the climate of their countries makes life easy."

Hypothesis:
The Climatic Determinism is firmly established in the public opinion of the Western world.

Second Question:

Is the social "climate problem" an "optimal control problem" ?

The macro economic control problem "climatic change"

- Climatic change causes damages (and benefits).
- The abatement of anthropogenic climatic changes absorbs economic potential, which may be measured by "abatement costs".
- Cost incurred by damages (or "adaption costs") and abatement costs must be balanced so that the overall costs are minimum.
- For the general idea the measure of costs is of secondary importance - it may be $ or "moral units".

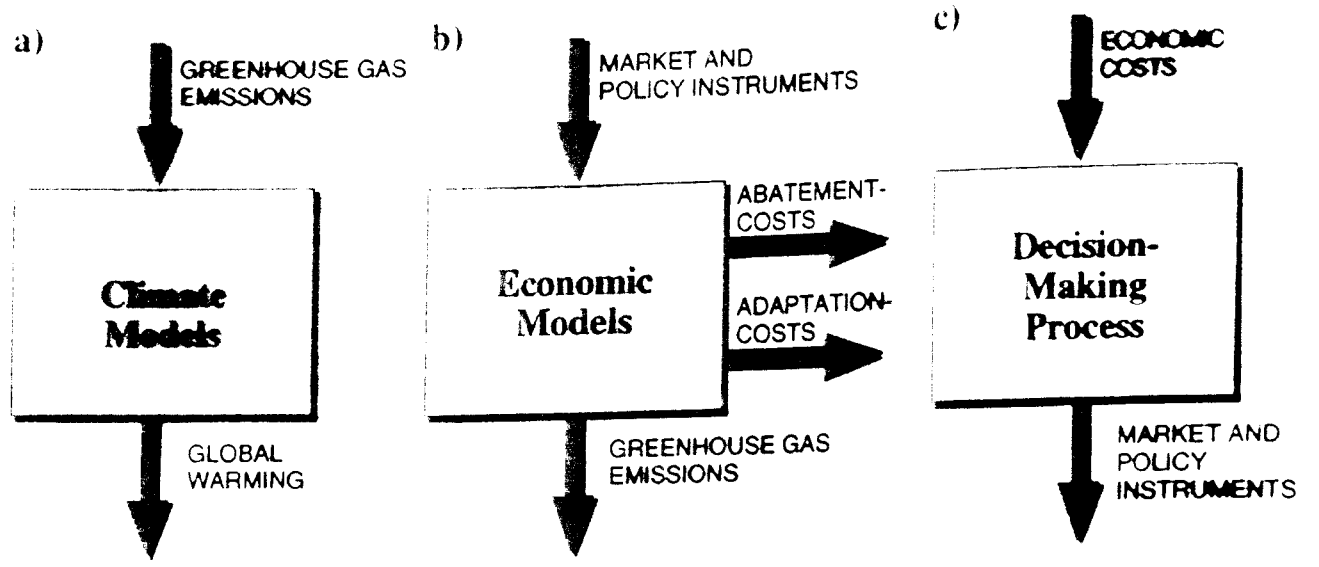
Global Environment and Society Model

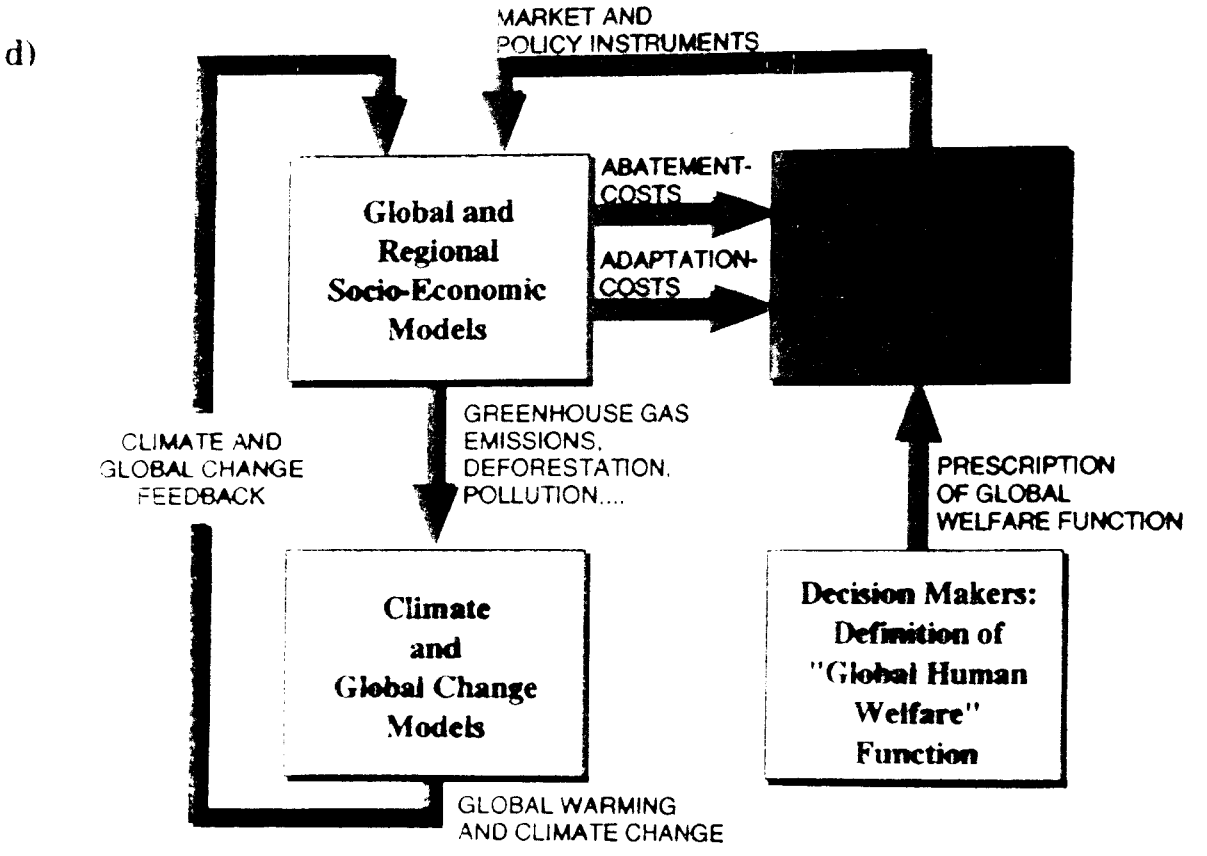
Assumptions:

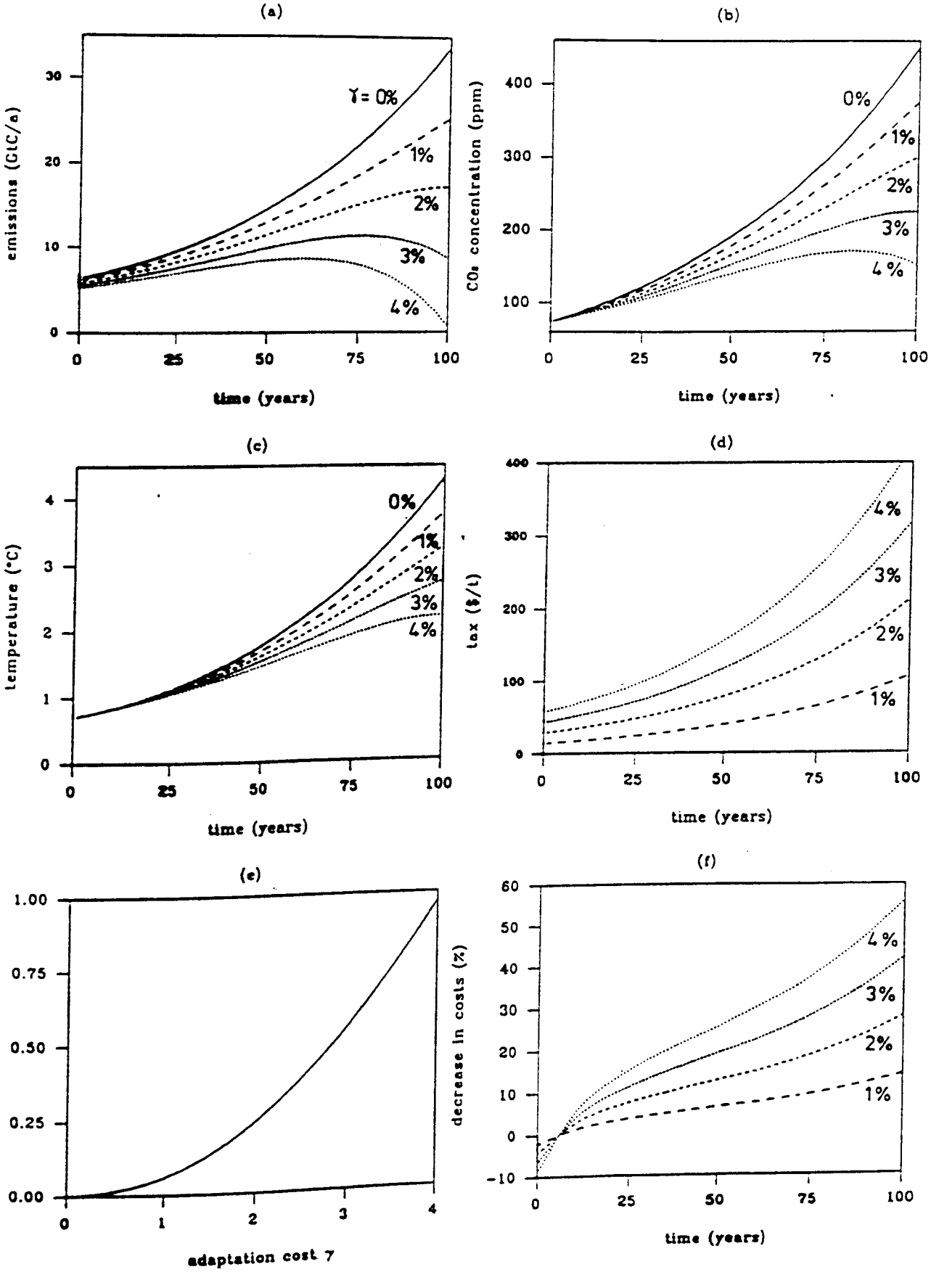
- One closed (wourld) economy
- Complete knowledge about ongooing evolutions and processes in climate and economy
- Rationale decisions

Control problem

- Cost function to maximize: maximum output
- Control to be selected: CO2 emissions


a)
GREENHOUSE GAS EMISSIONS
Climate Models
GLOBAL WARMING
b)
MARKET AND POLICY INSTRUMENTS
Economic Models
ABATEMENT-COSTS
ADAPTATION-COSTS
GREENHOUSE GAS EMISSIONS
c)
ECONOMIC COSTS
Decision-Making Process
MARKET AND POLICY INSTRUMENTS


d)
MARKET AND POLICY INSTRUMENTS
Global and Regional Socio-Economic Models
ABATEMENT-COSTS
ADAPTATION-COSTS
CLIMATE AND GLOBAL CHANGE FEEDBACK
GREENHOUSE GAS EMISSIONS, DEFORESTATION, POLLUTION....
PRESCRIPTION OF GLOBAL WELFARE FUNCTION
Climate and Global Change Models
Decision Makers: Definition of "Global Human Welfare" Function
GLOBAL WARMING AND CLIMATE CHANGE

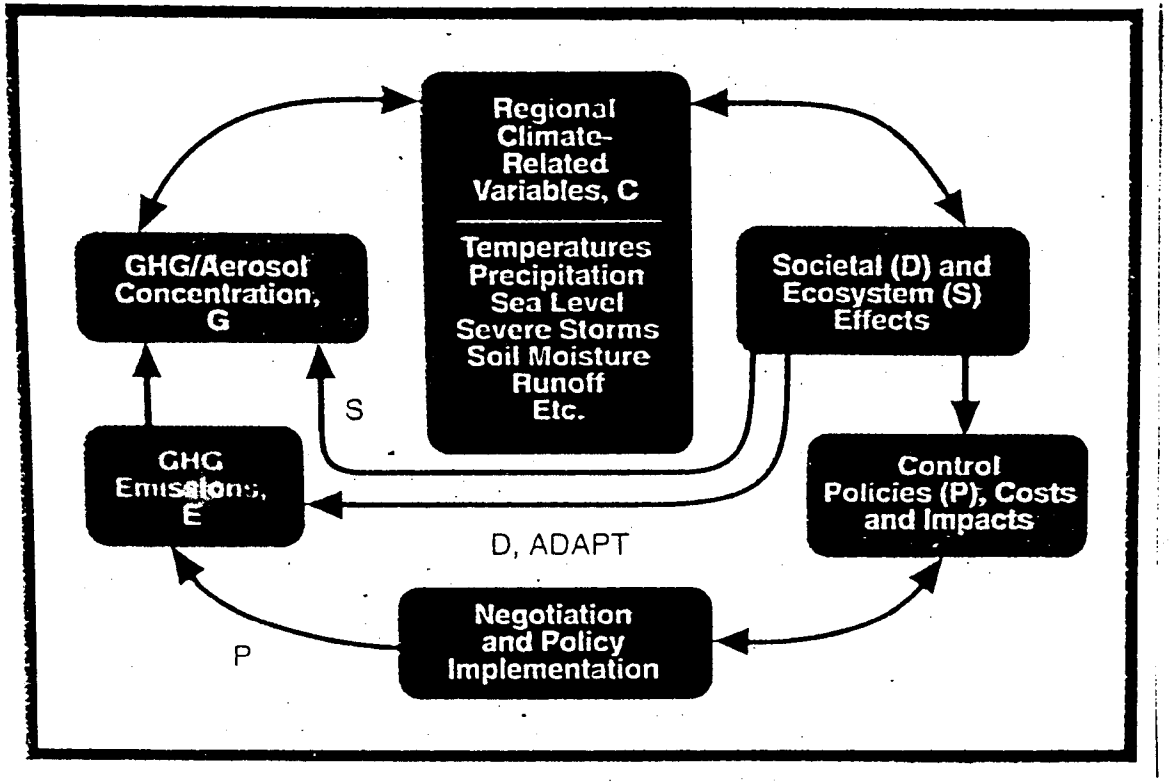

(a)
emissions (GtC/a)
γ = 0%
1%
2%
3%
4%
time (years)
(b)
CO2 concentration (ppm)
0%
1%
2%
3%
4%
time (years)
(c)
temperature (°C)
0%
1%
2%
3%
4%
time (years)
(d)
tax ($/t)
4%
3%
2%
1%
time (years)
(e)
increase in GWP (%)
adaptation cost γ
(f)
decrease in costs (%)
4%
3%
2%
1%
time (years)

Model may be criticized for

- being too simple
- using the "welfare function", which might not exist.

Model may need extension to describe feature

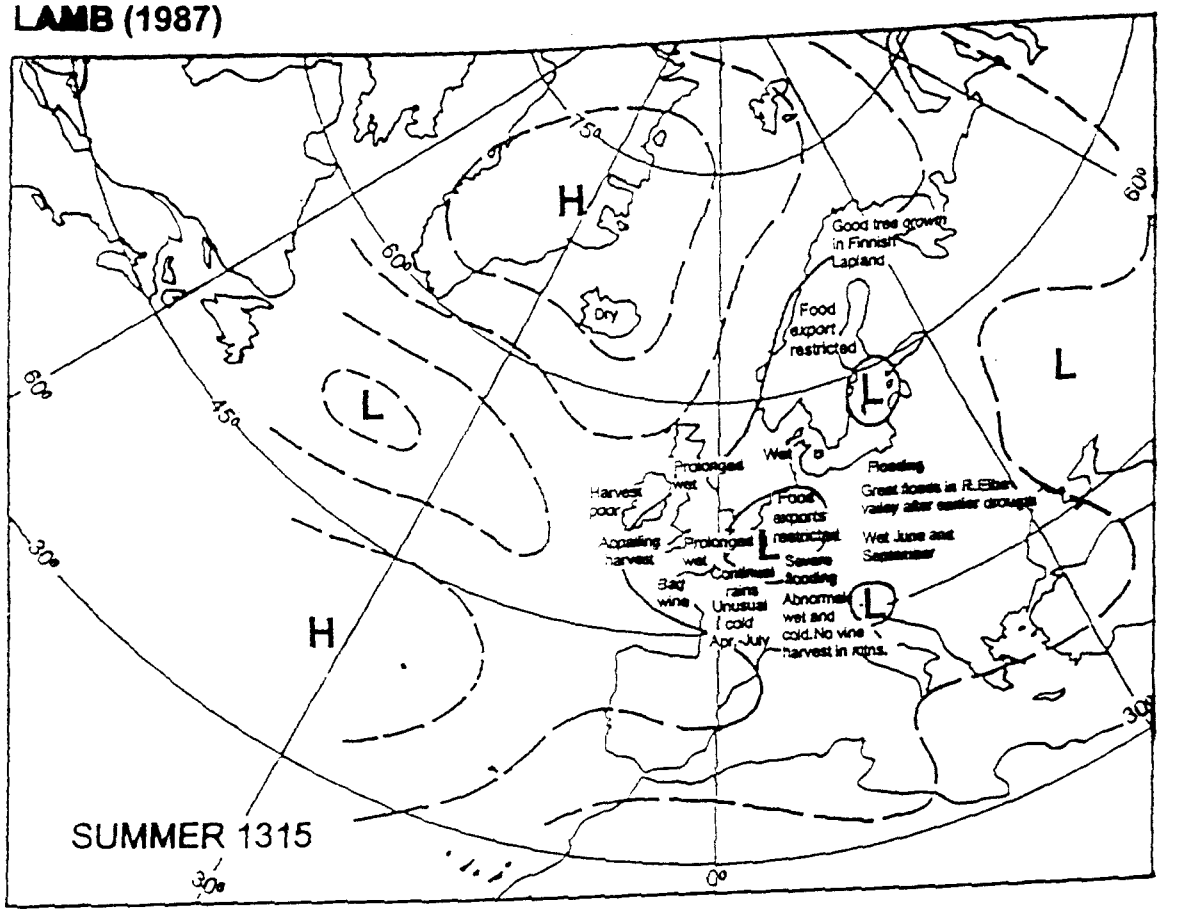
- gases, aerosols? } proposed by nat's
- areas
- variables
- game theory } econ's.
- disaggregation of "econ"



Climate policy 1315

- Social authorities (church) suggest that the ongoing climate catastrophy is because of god's wrath about un-christian way of life.
- "The Archbishop of Canterbury ordered ... solemn barefooted processions ... This was in the hope of encouraging the people to atone for their sins and appease the wrath of God ..."

LAMB (1987)



Map of the prevailing conditions reported in the summer of 1315, with suggested barometric pressure and wind pattern.

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Climate catastrophy in 1315

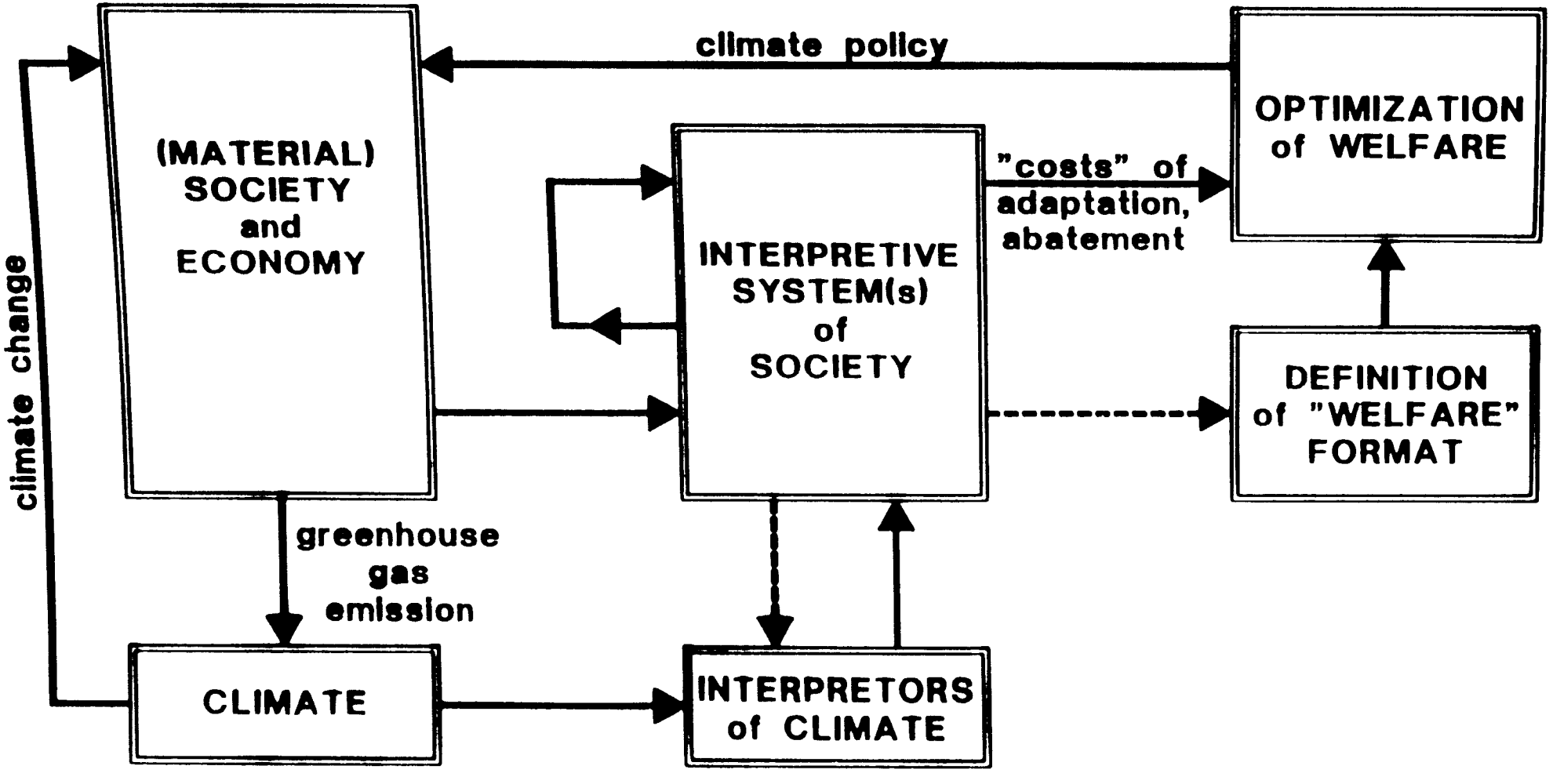
- Northern Europe 1315 (-1319): rainy summers, failed harvests
- High "adaption costs": famines, epidemies, migh mortality
- "Abatement policy" consists of various religious activities supervised by the church.
- "Abatement policy" is considerably cheaper (in units of "death" and "sin") than "adaptation policy".

Case 1 : England 1315 - 1317
Rainy summers have severly reduced the harvest .... 10% of the population left dead ...

... the climate policy

"... the archbishop of Canterbury ordered the clergy to perform solemn, barefooted processions bearing the Sacrament and relics, accompanied by the ringing of the bells, chanting of the litany, and the celebration of the mass. This was in the hope of encouraging the people to atone for their sins and appease the wrath of God by prayer, fasting, aims giving, and other charitable work."

was successful


climate policy
(MATERIAL)
SOCIETY
and
ECONOMY
OPTIMIZATION
of WELFARE
"costs" of
adaptation,
abatement
INTERPRETIVE
SYSTEM(s)
of
SOCIETY
DEFINITION
of "WELFARE"
FORMAT
climate change
greenhouse
gas
emission
CLIMATE
INTERPRETORS
of CLIMATE

053HVSa

Conclusion: Social Construct of Climate and Climatic Change

- The perception and the interpretation of real or imaginary evolutions in the environment are instrumental for social and political actions. Both processes, perception and interpretation, are determined by social dynamics and largely independent from the dynamics of processes in the real world.

- Climate and its change are mostly irrelevant for the formation and execution of policy; instead, the "social construct" of climate and climatic change steer social and political decisions.

What is the present "Social Construct" of Climate and Climatic Change?

Perception of climate
Examples

- "It's wrong what we are doing to the atmosphere because we are breathing all these chemicals that are being put into the atmosphere"
- "Pretty soon, we're not going to have any oxygen to breathe"
- "We shall be engulfed by the consequences of our greed and stupidity. Nearly two thirds of our wourld could disappear under polar ice cap water, melting as a result of ozone depletion and deforestation"

3. juni 94

Tegn på klimaændringer

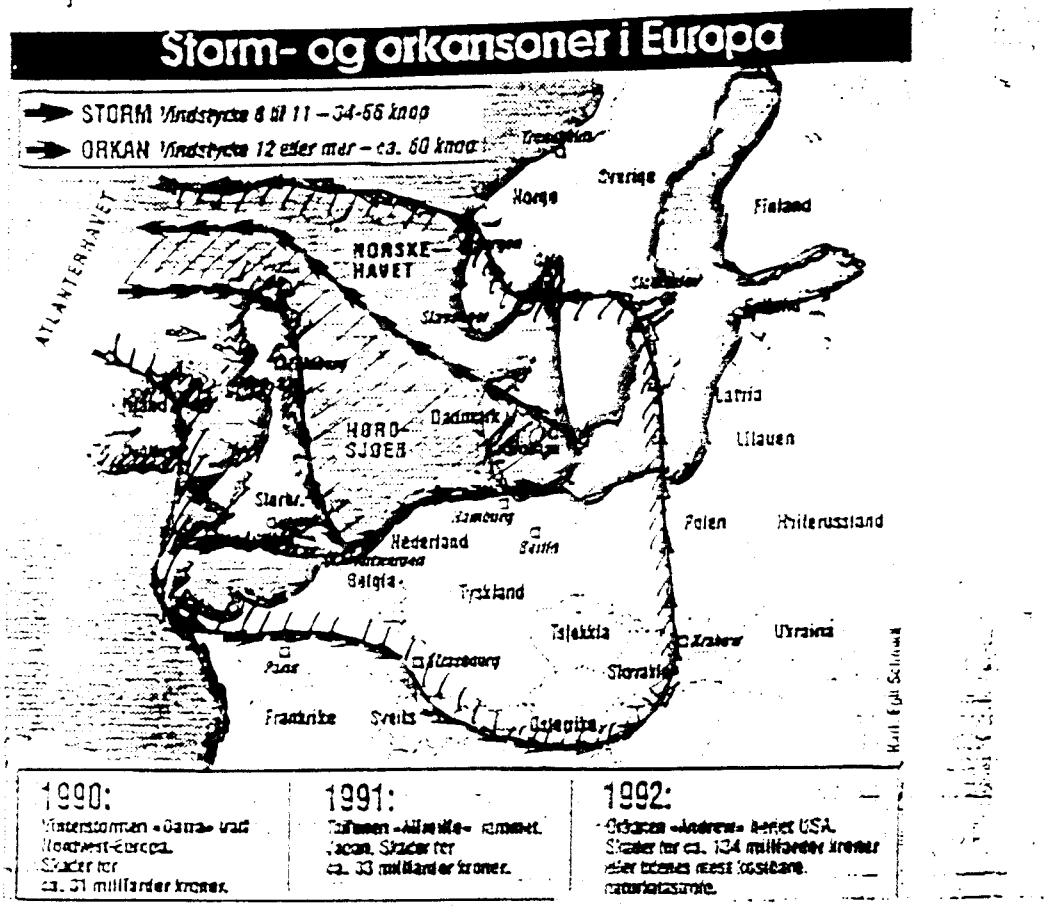
Miljøorganisationen Greenpeace har udsendt en rapport med beskrivelse af 500 ekstreme vejrhændelser – orkaner, rekordtemperaturer, tørke og lignende – fra de seneste tre år. De ekstreme begivenheder er taget til i antal i de senere år og tolkes af Greenpeace som de første tegn på klimaændringer som følge af drivhuseffekten. Rapporten 'Den tidsindstillede klimabombe', der i går blev overrakt til miljøministrene Svend Auken (S), vil blive opdateret hver halve år. (Pol)

Søvand til grundvand

De første forsøg med at danne nyt, rent grundvand ved at pumpe vand op af den plumrede [illegible] lade det sive ned

Orkan-alarm
over hele Europa

BRUSSEL: Aldri tidligere har stormene og orkanene ligget så tett over Europa, aldri har ødeleggelsene vært så store. Nå slår ikke bare klimaforskere alarm, nå trekker forsikringsbransjen i nødbremsen.



This is an example of climate information digestion, or eco-social impact. Due to recent storms and to the scientific "news" that our climate is changing to the worse, the insurance companies hire experts to motivate premium increases. Three European insurance companies will increase premiums for enterprises within the closure of arrows, and especially within the area enclosed by dark arrows.

Klimaforscher und die Wasser des

„Die Indizien für tiefgreifende Veränderungen unseres Klimasystems verdichten sich in den letzten Jahren unmißverständlich", warnt der Klimaexperte der SPD-Bundestagsfraktion, Michael Müller. Es scheint, als wolle die Natur beweisen, was der Mensch nicht wahrhaben will — daß er seinen Lebensraum langsam, aber sicher ruiniert. Die Statistiker liefern die dürren Fakten für solche Annahmen. In den 60er Jahren wurden 14 ökologische Großkatastrophen registriert, in den 80ern schon 70. Daß sich diese Zahl in unserem Jahrzehnt um ein Vielfaches steigern wird, läßt sich schon heute anhand der jüngsten Meldungen absehen. Laut Angaben des Klimaexperten hat sich die Schadensrate seit Beginn der 90er Jahre bereits vervierfacht. „Wir spielen russisches Roulett mit der Natur", meint Müller. „Die Veränderungen im Klimasystem — insbesondere die Zunahme der extremen Schwankungen und ungewöhnlichen Wettererscheinungen — sind ohne Zweifel dem Menschen zu verdanken."

Den Treibhauseffekt führt der SPD-Bundestagsabgeordnete als mögliche Erklärung für diese Veränderungen an, gekoppelt mit natürlichen Schwankungen und direkten menschlichen Eingriffen in die Natur. „Auf jeden Fall hat sich unser Erdball aufgrund unseres Schadstoffausstoßes global gesehen erwärmt", sagt er. Gase, die durch Verbrennung von Öl, Kohle und Gas in die Luft gelangen, wirken wie ein Treibhausdach. Sie lassen Sonneneinstrahlung in die Atmosphäre hinein, aber nur sehr schlecht wieder heraus. Die Folge: Erwärmung.

Nach Angaben von Gerhard Berz, Diplommeteorologe aus München, war „das letzte Jahrzehnt das mit Abstand wärmste seit Beginn weltweiter meteorologischer Beobachtungen Mitte des letzten Jahrhunderts". Die langfristigen Folgen wurden von Wissenschaftlern mit Computern vorausberechnet. Auf

New York Times
8. July 1992

—But Somebody Does Something About It

The weather, that is; many of man's activities affect it, but often without improving it.

By GEORGE H. T. KIMBLE

SOLSBERRY, Ind.

IF there is one thing the farmers who live around me are agreed upon, it is that the weather is not what it used to be: it's worse. The summers, they will tell you, are stormier; the autumns wetter; the winters longer; the springs later. If there is another thing most of them are agreed upon, it is the reason for these presumed changes: "The bombs are what done it."

What evidence is there that the weather can be altered by human agency—that man can do something, whether by accident or design, to the weather? Though meteorologists may argue about how much evidence there is, they are generally agreed that it is impossible to explain what is happening to the weather of certain places on

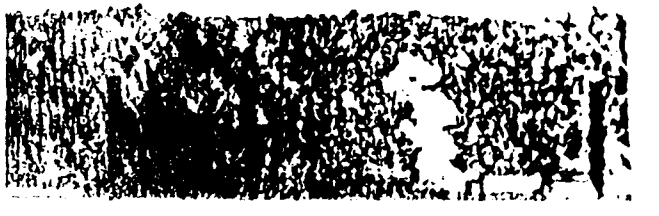
New Haven, Conn., and Rochdale, Lancashire, have been shown to have, on the average, about 6 per cent more rain on weekdays than on Sundays.

The characteristically greater average warmth of large industrial towns compared with neighboring countrysides is likewise a product, in part, of pollution, for the greater cloudiness (itself related to the greater raininess) which the condensation nuclei induce has a "glass-house" effect—it allows the shortwave radiation (light) from the sun to pass through to the surface but prevents the longwave radiation (heat) from escaping from the surface into the free air as readily as would otherwise be the case.

BUT evidence of man-made weather

WEATHER—AND THREE MAN-I

THE BOMB—Its effects are not known but they may include temporary increases in the trade winds and in storminess.



I think our weather is more unpredictable now, we've got more modern satellites and all to predict the weather and I think they're worse at predictin' it now than when they didn't have them. So, your seasons don't seem to run the same. I mean, they're less predictable for patterns. . . . Like now in the spring you get real hot weather like the summer, and then when the summer comes you got weather that's like the spring, and then in the middle of winter sometimes you get weather that's almost like summer. It isn't an even pattern. *When would you say you started noticing that . . .?* I don't know, it's come on gradual.—Walt (retired machinist)

1 The weather has been more variable and unpredictable recently around here.

Earth First!	Sierra Club	Public	Dry cleaners	Sawmill workers
93	52	79	73	74

Well, I like warm weather, personally, but I think it's wrong for what humans are doing to the atmosphere. *In what way?* With all the aerosols and the ozone and so forth . . . that's being projected up into the atmosphere. . . . [*If you like warm weather, why do you say the greenhouse effect would be wrong?*] Well, I think it's wrong because at the same time, we are ingesting and breathing in all these different chemicals that are being put into the atmosphere.—Susan (hospital administrator)

Well it has to do, I think, with the climate changing as a result of the atmosphere, atmospheric changes that are presently going, and cutting down all of our woods takes away a certain chem—the oxygen, or something, that is required for us to have good air quality, and it's kind of scary.—Tara (sales manager)

That's what scares me. *What?* When they cut all the forests down, they say, pretty soon we're not going to have any oxygen to breathe. Why do they let them do that?—Cindy (housewife)

94 If they cut all the forests down, we would soon run out of oxygen to breathe.

Earth First!	Sierra Club	Public	Dry cleaners	Sawmill workers
64	58	77	67	44

If the weather gets a lot warmer, do you think it would be good, bad, or neutral? I think it would be bad; I think it would be terrible. *Why?* Well, I think people react differently in warm weather than when it's cooler. I think it has an effect on attitudes—behavior. . . . I mean in the prison system especially, where the people are just, you know, stuck in there, and they've got to let off steam. So, sure. *So you think in prison it makes people more violent?* Sure, but outside the prisons, too, 'cause I even see it at work; you know, when the weather is extremely warm, people tend to be, you know, a little hot tempered. I think, you know, their blood boils. And when the blood boils in the body, it goes to the head, and next thing you know, there's, you know, an explosion. . . . I've seen them react that way.—Paige (manufacturing worker)

I have my own private theory. [pause] *What's that?* That every time they shoot something up in space it disturbs things up there! *There could be something to that.*' I've been told I have no foundation for that, but it just seems every time something happens we get this strange type of weather. . . . *Like what?* . . . Well, for instance, tornadoes were very rare in this section of the country . . . tornadoes, and violent-type storms. . . . It used to be rather calm here.—Susan (hospital administrator)

(In response to a request for ideas as to what could be done about the greenhouse effect:) Well, I don't know what the hell they're doin' up on the moon and shooting those things up there. I think they're disturbing the atmosphere. So much rain we've had, so much rain.—John (retired factory foreman)

97 There may be a link between the changes in the weather and all the rockets they have fired into outer space.

Earth First!	Sierra Club	Public	Dry cleaners	Sawmill workers
79	33	43	31	48

GREEN GLOBE YEAR BOOK 1994 (Dunlap)

Table 4. Perceived seriousness of environmental problems in the world* (%)

	% saying 'very serious'						
	Air pollution	Water pollution	Contaminated soil	Loss of species	Loss of rain-forest	Global warming	Loss of ozone
North America							
Canada	61	77	57	58	71	58	70
United States	60	71	54	49	63	47	56
Latin America							
Brazil	70	69	56	73	77	71	74
Chile	73	77	64	72	71	59	78
Mexico	77	78	77	81	80	62	71
Uruguay	78	77	68	76	90	69	84
East Asia							
Japan	43	43	29	37	47	47	55
Korea (Rep.)	55	49	27	33	24	47	54
Philippines	49	46	42	44	65	40	37
Other Asia							
India	65	50	35	48	54	36	40
Turkey	72	61	54	61	63	45	59
Eastern Europe							
Hungary	54	53	42	47	47	33	47
Poland	77	80	73	76	73	59	66
Russia	71	74	63	61	65	40	59
Scandinavia							
Denmark	61	72	42	62	84	55	65
Finland	58	67	52	48	71	34	60
Norway	69	71	55	61	80	66	70
Other Europe							
Germany (West)	61	70	55	69	80	73	78
Great Britain	52	72	50	60	79	62	66
Ireland	63	74	52	55	67	63	68
Netherlands	30	43	36	45	70	36	47
Portugal	78	81	71	68	82	72	79
Switzerland	62	69	46	61	78	62	68
Africa							
Nigeria	43	44	47	34	31	26	27

Note: *Respondents were asked: 'Now let's talk about the world as a whole. Here is a list of environmental issues that may be affecting the world as a whole. As I read each one, please tell me how serious a problem you personally believe it to be in the world—very serious, somewhat serious, not very serious, or not serious at all—or you don't know enough about it to judge? a. Air pollution and smog; b. Pollution of rivers, lakes, and oceans; c. Soil erosion, polluted land, and loss of farmland; d. Loss of animal and plant species; e. Loss of the rain forests and jungles; f. Global warming or the "greenhouse" effect; g. Loss of ozone in the earth's atmosphere.'

Source: Riley E. Dunlap, George H. Gallup, Jr., and Alec M. Gallup (1993), *Health of the Planet* (George H. Gallup International Institute, Princeton, NJ).

The Tampa Tribune, Saturday, March 12,

2 major hurricanes seen for '94

An Orlando Sentinel Report

NEW ORLEANS — Fasten your safety belts. Tie down your roofs. This year's hurricane season could be quite a bumpy ride.

And the outlook for the rest of the decade could be even worse.

"We're going to see more hurricane damage in this country than we've previously seen. It's a very ominous thing," meteorologist William Gray warned Friday as he released his annual forecast on the closing day of the National Hurricane Conference.

By Gray's measure, conditions that contribute ... of

..., and the ... easing of the 25-year-... in west Africa. Both changes make for ripe hurricane conditions, Gray said.

Many meteorologists believe that, statistically, Florida is due for an increase in hurricanes. From 1943 to 1965, 116 hurricanes passed through or near the Sunshine State. During a similar period from 1966 to 1987, the number dropped to 35.

What is the role of climate researchers?

- Is there a tendency for dramatisation?
- External factors: positive feedback between
  - politicians' need for public visibility,
  - media's need for catastrophies, and
  - scientists' need for public funding.
- Subjective factors:
  - Egocentricity (overstating the importance of problems related to own field of research)
  - Mixing of uni-disciplinary scientific qualification with layman's engagement (e.g., physical scientists making. predictions about future climate wars)
  - Addiction to public recognition ("lime light disease")

Ursache der drohenden Seuchenzüge ist der Treibhauseffekt. Im kommenden Jahrhundert, so sagen die Klimaforscher vorher, erwärmt sich unser Globus im Mittel um 1,5 bis zu 4,5 Grad Celsius. Dabei wird ein Teil der gemäßigten Breiten für zahllose tödliche Bakterien und Viren zum neuen Paradies; ebenso für ihre Überträger wie Ratten, Insekten oder Schnecken.

Der Treibhauseffekt, so das Ergebnis unzähliger Studien, birgt weitere, teils apokalyptische Gefahren. So bedrohen Sturmfluten die Küstengebiete. Im Innern der Kontinente bleiben die Niederschläge aus. Der Dürre folgen Trinkwasserknappheit sowie Hungersnöte mit Millionen von Toten. Zugleich fordert eine steigende Zahl von Gewitterstürmen mit sintflutartigen Regenfällen und riesigen Überschwemmungen ihren tödlichen Tribut.

se zeigen, daß das Erdklima permanent schwankte. Warum müssen wir uns dann Sorgen machen?

[redacted]: Drei Grad in 100 Jahren hat es noch nicht gegeben. Die eigentliche Gefahr ist nicht, daß es wärmer wird, sondern es ist die Geschwindigkeit der Klimaveränderung. Ein Wald braucht etwa 500 bis 1000 Jahre, um sich auf neue Verhältnisse einzustellen. Die ohnehin schon schadstoffbelastete Natur steht unter einem starken Anpassungsstreß, den sie wahrscheinlich nicht bewältigen kann.

STERN: Und was wird in der Atmosphäre los sein?

[redacted]: Wir müßten immer öfter mit starken Tiefdruckgebieten und Stürmen rechnen. Möglicherweise kann dann auch Landwirtschaft nicht wie bisher betrieben werden, weil bei steigendem Meeresspiegel unser Grundwasser versalzt. Auch die Sahara könnte sich zum Beispiel übers Mittelmeer hinaus nach Norden ausdehnen. Und wenn bestimmte Landstriche nicht mehr bewohnbar sind, werden die Menschen dort hinziehen, wo noch akzeptable Bedingungen herrschen. Es gäbe Völkerwanderungen und Klimakriege.

Conclusions

- The social dynamics makes climate change a social problem, not the physics.
- Integrated assessment modelling efforts must be seen with great reservation not only because of the enormeous difficulties to specify the involved models but because of fundamentally idealizing assumptions about the social and political decision process.
- The present public debate about the impact of anthropogenic climate change is not unique or new.
- Physical scientists have the same qualification to engage in a discourse about the social and political implications of climate change as any other layman.