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[Global Climate Change & China] [loose] [1]

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Background on the U.S. EPA-China Environmental Cooperation

The Governments of the United States of America and the People's Republic of China signed an Agreement on Cooperation in Science and Technology on January 31, 1979, in which the two countries agreed to work together to promote scientific and technical cooperation.

Under the umbrella of this broad S&T Agreement, separate protocols have been signed in a variety of fields between individual agencies of the U.S. Government and their counterparts in the People's Republic of China. The U.S. EPA and China's State Environmental Protection Administration (SEPA) manage one of these — the Protocol between the Environmental Protection Agency of the United States of America and the People's Republic of China for Scientific and Technical Cooperation in the Field of Environmental Protection. This Protocol was signed on February 5, 1980.

EPA also manages a number of efforts outside of the Protocol's framework, often in conjunction with non-governmental organizations, national laboratories, and the private sector. EPA plays an active role in Administration China initiatives including the US-China Forum on Environment and Development, co-chaired by Vice President Gore, and the US-China Energy and Environment Cooperation Inititiative.

The following sections summarize ongoing and planned cooperation areas:

CLIMATE-RELATED ACTIVITIES:

Climate Change Joint Research/Policy Program

International Co-Control Analysis - As part of a multi-country effort this project will bring US and Chinese researchers together to analyze the environmental benefits of measures that will contribute to reductions in greenhouse gas emissions. On the US side the work will be carried out primarily by WRI. (See attached 1-pager) - OP lead. FY 98 (not yet funded).

National Economic Modeling of Climate Change - In cooperation with the President's Council of Economic Advisors this joint effort with Chinese experts will develop improved capacity for analysis of costs and economic impacts of policies to limit increases in greenhouse gas emissions and carry out analysis of flexibility mechanisms. Partners on US side include Harvard University and Pacific Northwest National Laboratory. (See attached 1-pager) - OP lead. FY 98 (not yet funded).

Technology Cooperation Agreements Pilot Project (TCAPP) - TCAPP is a voluntary partnership to advance implementation of clean energy technologies. USAID funds the program in five countries while EPA funds the China program. Implemented by the National Renewable Energy Laboratory with in-country partners, the program assists country teams in developing and implementing climate technology plans and in engaging private sector and donor organizations. (See attached 1-pager) - OP lead. FY 98.

Atmospheric Pollution Prevention Projects

Coalbed Methane Recovery and Use - This EPA effort began in 1990 and has been implemented jointly with a $10 million GEF-funded effort which has just been completed. EPA will participate on the evaluation panel. Technical cooperation in demonstrating advanced methane recovery technologies at three sites in China; and establishment, technical support, and staff training for a Coalbed Methane Clearinghouse at the China Ministry of Coal. International Coalbed Methane Conference held in October 1995. The Clearinghouse and EPA prepared a joint report (in English and Chinese) entitled "Reducing Methane Emissions from Coal Mines in China: The Potential for Coalbed Methane Development" (1996). EPA is also providing technical cooperation to an APEC coalbed methane scoping effort in China which is moving to the design phase for enhances recovery and town gas use. EPA represents the US on the APC 4-nation advisory panel. A coalbed methane investment workshop is planned for November 9-11 in China and will be followed by a technical workshop co-hosted by EPA and the State coal Industry Bureau. Partners include United Nations Development Program - Global Environmental Facility, China Ministry of Coal Industry, China United Coalbed Methane Corporation, LTD, and the APEC Experts' Group on Clean Fossil Energy. Office of Air and Radiation / Atmospheric Pollution Prevention Division lead.

Energy Efficient and CFC-free Refrigerators - Technical cooperation with Chinese regulators and factory managers in converting refrigerator factories to produce models which use 50% less energy and are non-ozone-depleting. Design and testing of domestic Chinese refrigerators. Analysis of China's market transformation of refrigerator industry, including refrigerator design and evaluation; testing, manufacturing, and marketing. Partners include China National Council of Light Industry, Beijing Household Electrical Appliance Research Institute, China State Environmental Protection Administration, Montreal Protocol Fund and Global Environmental Facility, Germany's GTZ, University of Maryland, Lawrence Berkeley National Laboratory. Office of Air and Radiation/APPD lead.

Technical Assistance for energy-efficient lighting in China - Provide training at China's State Bureau of Technical Supervision and the Beijing Energy Efficiency Center in the development of standards for energy-efficient lighting in China, and in test procedures to improve production in China of energy-efficient fluorescent lamps. Carried out by Lawrence Berkeley National Laboratory with the China State Bureau of Technical Supervision and the Beijing Energy Efficiency Center, and State Economic and Trade Commission. OAR/APPD lead.

Technical Assistance to improve energy efficiency of air conditioners in China - This project will assess and assist market transformation efforts to attain market dominance for energy efficient air conditioners. Specific efforts in China include monitoring air conditioner energy use and operating patterns, development of efficiency standards, and addressing technical and market barriers to air conditioner efficiency improvements. Carried out by American Council for an Energy Efficient Economy, Lawrence Berkeley National Laboratory, Beijing Energy Conservation Center, and State Economic and Trade Commission. OAR/APPD lead.

Halon Phaseout Program - Training of Chinese fire protection experts in operation of Halon 1211 recovery/recharge machines, and fire-extinguisher maintenance practices to prevent

unnecessary Halon emissions. Three workshops held in 1993 with 128 experts trained and 23 machines delivered for operation in various cities and provinces throughout China. Initial assessments completed of Halon use in major manufacturing sectors. Parners are U.S. Navy,Chinese Ministry of Public Security, United Nations Development Program / Global Environmental Facility, Montreal Protocol Fund, China State Environmental Protection Administration. Office of Air and Radiation/Stratospheric Protection Division lead.

Environmental Technology Intiative (USTIES) Climate-related Projects:

Pollution Prevention in the Petrochemical, Pharmaceutical, and Metal Finishing Industries of China - Technical cooperation with China on pollution prevention technologies and practices through workshops, assessments, and technology demonstrations. Completed
Partners include State of Illinois, US Environmental Protection Agency - Office of Research and Development, World Bank, United Nations Environment Program

U.S. - China Energy and Environment Technology Center - Technical cooperation with China to disseminate information on energy and environmental technology related to electric power. Information exchange, demonstrations, and research on energy and environmental technologies such as clean coal, oil and gas. Partners are EPA - Office of International Activities U.S. Department of Energy, Tulane University, China's State Science and Technology Commission.

Integrated Gasification Combined Cycle (IGCC) Power Generation To Achieve Emissions Reduction - Technical cooperation with China to construct an IGCC demonstration power plant which uses 1/3 less water and produces less CO2 and toxic emissions than other coal burning technologies. Cost efficiency studies, research and identification of manufacturing capabilities in China, and workshops and training on IGCC technology and benefits. Partners are U.S. Department of Energy, Texaco Corporation. OIA lead.

Energy Efficient Buildings Project - Hong Kong - Demonstration in government office building of measures to make buildings more energy-efficient. Partners are U.S. Department of Commerce, US-Asia Environmental Partnership, Hong Kong Polytechnic University, Hong Kong EMSD, The Negawatts Company. OIA lead.

Asia Pacific Initiative for Renewable Energy and Energy Efficiency - Technical cooperation with China to increase the acceptance and understanding of renewable energy technologies in Asia through training workshops, development of model regulations, and technology demonstrations. Partners are U.S. Department of Energy, U.S. Export Council for Renewable Energy, International Institute for Energy Conservation, APEC. OIA lead. EPA involvement completed.

Wind Energy Mapping - Technical cooperation with China to compile information on wind resources in the People's Republic of China, expected to facilitate greater U.S. private sector involvement in wind energy projects in China. U.S. Department of Energy, National Renewable Energy Laboratory.

OTHER ACTIVITIES

Pollution Prevention and Environmental Education - The Air and Waste Management Association is working with China's Tianjin City and Anhui Province to improve capacity of pollution prevention centers. AWMA is also working with China's Global Village Institute to develop and implement environmental education programs. Partners are Air and Waste Management Association, China State Environmental Protection Administration, Tianjin and Anhui Environmental Protection Bureaus, China Global Village, Beijing. OIA lead.

Mobile Sources Emissions Control/Leaded Gasoline Phaseout - A conference/workshop in Beijing, held in October 1995, provided recommendations to the Chinese government on fuels, leaded gasoline phaseout, emissions controls, and transportation planning. Technical recommendations were incorporated into the Ninth Five-Year Plan and in related statutes under consideration in China's legal system. EPA's cooperation was instrumental in China's adoption of legislation calling for the phaseout of lead in gasoline. In follow-up, a NEPA official spent three months at EPA. EPA continues to work closely with NEPA and other organizations on implementing regulations, and organizing training workshops, held in Shanghai and Xiamen in March 1997, on mobile sources air pollution control and lead phaseout, including the development of technical and educational materials for officials and the public. EPA - Office of International Activities, China State Environmental Protection Administration. OIA lead.

Technical Support for China's Nationwide Air Quality Monitoring Network - EPA will provide support in Phase I (eleven cities) of the development of an integrated nationwide air quality monitoring network, and EPA intends to cooperate on Phase II which will extend the network to 47 cities. National and local level officials will receive training through the State of California and at RTP, and US experts will provide on-the-ground advice in siting and calibrating equipment, data collection and analysis, forecasting. Project will assist China in tracking and controlling pollution sources and in raising public awareness. Partners are U.S. Department of Commerce, California Air Resources Board, National Association of State Development Agencies, China State Environmental Protection Administration. OIA lead. FY98.

Sectoral Energy Efficiency Studies - Technical cooperation to assess alternative energy utilization scenarios for particular sectors which are considered major contributors to greenhouse gas emissions. The final outcome will be a detailed roadmap of technologies, environmental benefits, and costs for individual sectors. Carried out by Lawrence Berkely National Laboratory. OIA lead.

Children's Lung Function Study - An epidemiological study of the effects of air pollution on children's lung function in four Chinese cites: Wuhan, Chongqing, Guangzhou, and Langzhou. The project has generated data useful in U.S. for setting of air quality standards, especially for particles (fine and PM10). EPA - Office of Research and Development / National Center for Environmental Assessment (NCEA-RTP) through agreement with Robert Woods Johnson School of Medicine, China State Environmental Protection Administration - Chinese National

Environmental Monitoring Center. ORD lead.

Technology Seed Grant to National Assoc. Of State Development Agencies - Technical cooperation with China to transfer U.S. environmental technologies to areas of critical need in China. NASDA provides assistance to U.S. state development agencies which fund demonstrations of U.S. environmental technologies in China. Among the technologies are: Venturi Scrubber Technology for Fine Particulate Control; CAF System Industrial Wastewater Treatement; Bioremediation Wastewater Treatment for Capital Steel; Wastewater and Energy Improvements for Juxian Pulp & Paper Mill; Mobile Industrial Wastewater Treatment Demonstration Unit; Electric Bicycle Design Modification and Demonstration, Air Quality Monitoring. Managed by National Association of State Development Agencies (NASDA). OIA lead.

Pollution Prevention and Control in China's Huaihe and Haihe River Basins - Technical cooperation with China to utilize U.S. environmental pollution prevention and control technology and management approaches in solving a severe water pollution problem in watersheds which have been identified as a priorities at the top levels of the Chinese government. Partners include the Maryland-China Business Council, U.S. Environmental Training Institute, Air and Waste Management Association, China's Anhui Province Environmental Protection Bureau, National Association of State Development Agencies, The World Bank. OIA lead.

Genetic Susceptibility to the effects of aromatic solvents on reproductive health - Technical cooperation in evaluating the effects of aromatic solvent exposure on the reproductive health of workers at a Chinese petrochemical complex. Carried out by Harvard University School of Public Health and Beijing Medical University, and Yanshan Petrochemical Refinery, Beijijng. ORD lead.

Epidemiological and Biomarker Study of Health Effects of Arsenic Exposure - To conduct research on serious endemic arsenic exposure in Inner Mongolia. ORD lead.

Chemical Transformation Processes - Metal Interactions at Organic Matter Surfaces - Technical cooperation in the development of models to predict distribution of heavy metals on organic matter surfaces and in pore water, and to predict metal speciation in both phases. Research results have been presented at several scientific conferences. EPA - Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Academy of Environmental Sciences. ORD lead.

Chemical Transformation Processes - Metal Interactions at Mineral Surfaces - Technical cooperation in geochemical research. Research results presented at two conferences; five journal articles and one book chapter published. Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Center for Eco-Environmental Sciences. ORD lead.

Modeling Chemical Transformation Processes and Metals Pollution in China's Poyang Lake - Technical cooperation in investigations of the dynamics of pollutant transport and

biogeochemistry. Modeling of geochemical processes in freshwater sediments. Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Center for Eco-Environmental Sciences. ORD lead.

Water Quality Study of China's Zhejiang Harbor - Technical cooperation in development of water quality models for tide gates; and simulation of waste load reduction effects on water quality. Development of management tools to achieve water quality goals in an important Chinese seaport and historic tourist area negatively impacted by navigation and industry. EPA - Office of Research and Development / National Exposure Research Laboratory (NERL - Athens), China's Nanjing Institute of Environmental Sciences. ORD lead.

Effects of Global Climate Change on Large Lake Systems - Technical cooperation as part of a global project: "Factors Influencing Terrestrial Organic Matter and Trace Gas Dynamics in Temperate Forest, Wetland, and Agricultural Soils." Field and laboratory studies of organic matter transformations, ecosystem productivity, and effects of climate variations on organic matter cycling. Office of Research and Development / National Exposure Research Laboratory (NERL - Athens), China's Xinjiang Province Institute of Environmental Protection. ORD lead.

Joint Biomonitoring of Toxic Discharges, Nanjing River - Technical cooperation with Chinese regulatory agencies in evaluation of toxicity of aquatic discharges. Development of toxicity identification techniques with benefit to U.S. regulators in implementing effluent toxicity limits. Office of Research and Development / National Health and Environmental Effects Research Laboratory (NHEERL - Duluth), China National Environmental Protection Agency, China's Nanjing City Environmental Protection Bureau, Nanjing University, University of Minnesota-Duluth. ORD lead.

Other USTIES Projects

Hazardous Waste and Toxics Disposal - Technical cooperation to strengthen China's toxic waste regulations, provide demonstration facilities and sample technical specifications for hazardous waste treatment, and evaluate hazardous waste treatment technologies for China. Partners include New York State Department of Environmental Conservation, China National Environmental Protection Agency, World Bank, Asian Development Bank. OIA lead.

Demonstration of Combined NOx/SOx Control Technology - Field demonstrations of a low-cost NOx and SOx removal technology. Carried out by Southern Research Institute. ORD lead.

Membrane Drinking Water Treatment - Technical cooperation with China to demonstrate cost-effective technologies for the control of toxic chemicals and pathogenic microorganisms in drinking water in China. Partners include U.S. Department of Agriculture, Shandong Province Water Resources Management Office, Zibo City, Shandong Province, China Ministry of Geology and Mineral Resources, China Institute of Hydrology. ORD lead.

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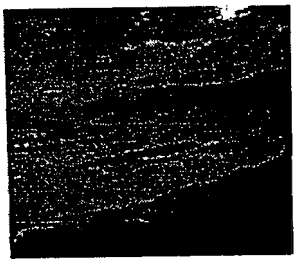
China: State of the Environment 1997

BEIJING, China, August 25, 1998 (ENS) - China has launched an annual State of the Environment report on the World Wide Web. In the first report covering the year 1997, the Chinese government acknowledges that the planet's environment is in "a crisis."

The majority of the scientists of the world fear that life itself as we know it today is severely threatened, the first report states.

Elements of this crisis are seen by the Chinese government to include global warming caused by emission of greenhouse gases from human activities. Thinning of the ozone layer, acid rain, toxic transboundary emissions, toxic discharges to air, soil and water as a cause of disease and overconsumption of natural resources are all recognized as serious problems.



Site of the Three Gorges dam on the Yangtze River prior to the start of construction of what will be the world's largest dam.

Prepared by staff of the State Environment Protection Administration (SEPA) in Beijing, the report includes information from the environmental statistics, information technology, environmental monitoring and academic research divisions.

The goal of the State of the Environment report is to create a tool for the decision-makers and the people of China that "increases awareness of the environment, making it easier to assess the present dangers, take the right precautions in time, and steer the development in a sustainable direction," the report says.

The report presents an idealist vision of a future of clean air, clear waters, fertile soils and healthy forests.

ECONOMIC AND POPULATION GROWTH CAUSE ENVIRONMENTAL PROBLEMS

Rapid economic development is an important force driving the environmental problems of China. In 1977, the Chinese economic growth rate was 8.8 percent. From 1993 to 1997, the average annual economic growth rate in China was 11 percent, above the world average, and above the average of the developed and developing countries. China's economic growth rate occupied first place in the world, and the Gross Domestic product ranked seventh in the world.

Shanghai, on the Huangpu River, is China's largest city.

The other crucial force creating China's environmental problems is population growth, the report acknowledges. The population of China reached 1.224 billion in 1996. The natural growth rate of population was lowered to 1.001 per cent in 1997 from 1.2 per cent in 1978.

"The population increase, although providing a gigantic manpower supply and huge market for economic development, caused the relative shortage of natural resources and thereby the rapid decline of land and forest areas as well as water resources per capita," the report states.

In 1997, seven large river systems, lakes, reservoirs and underground water supplies in some regions were contaminated. In that same year, the total amount of discharged wastewater was 41.6 billion tons.

To deal with these water problems, the report says China is setting deadlines for enterprises to comply with government standards and strengthening industrial pollution control and treatment. The government is investing in 28 key pollution control projects and establishing coastal resource conservation management systems.

China's forested lands have declined from a pre-industrial cover of 60 percent to the present coverage of seven to eight percent. In 1997, the report states, 2.5 billion trees were planted,

producing over 4 billion forested hectares. One million hectares were reforested by aerial seeding, and 3.8 million hectares were closed off for protection.

Endangered Chinese panda bear in bamboo forest.

About threats to China's wildlife, the report says only that "the protection of biodiversity has been facing serious challenges due to the rapid population growth and changes in the biological environment."

To conserve its wildlife, the government established 18 new national nature reserves in 1997, and now has a total of 124 reserves. Twelve of these are listed by UNESCO as Biosphere Reserves. China has 926 forest parks covering 7.7 million hectares.

China's State of the Environment website is funded by Norwegian Agency for Development Cooperation (NORAD) and supported technically by United Nations Environmental Programme / Global Resources Information Database - Arendal, Norway.
http://svr1-pek.unep.net/soechina/index.htm

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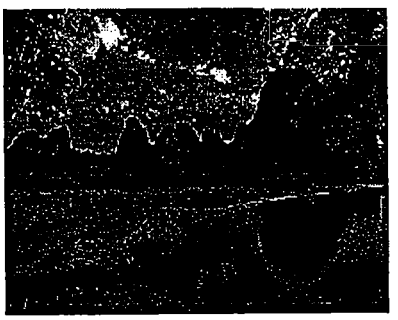
Welcome to State of the Environment CHINA 1997

You are our 000330 visitors since 15 March, 1997

Last update 24 August 1998.



This project is funded by Norwegian Agency for Development Cooperation (NORAD) and supported technically by United Nations Environmental Programme / Global Resources Information Database - Arendal, Norway (UNEP/GRID-Arendal)

SEPA, China
UNEPnet, Beijing
UNEP/GRID-Arendal
1998 SoE Norway
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 Driving Forces

 Urban Environment

 Water Environment

 Biodiversity

 Acid Rain

 Ozone Layer Depletion

 Land Resources

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 Evironmental Management

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State of the Environment, China '97

SoE China 1997

About SoE China 1997

Background

The environment of the planet is in a crisis:

- Emissions of greenhouse gases from human activities now seem to cause a change in the climate and a global warming.
- The ozone layer high up in the air, protecting life on the Earth from lethal ultraviolet rays from the sun is thinning.
- Acid rain damages the soil, forests and health of plants and animals.
- Toxic, transboundary emissions to air are a threat to health all over the world.
- Eutrophication of water can make it undrinkable or unfit to use in other ways.
- Discharges of toxic contaminants to air, soil and water may cause diseases like cancer, allergies, reduce the natural resistance against disease and damage the genes of all living organisms.
- There is a widespread overconsumption of water, forests and fish resources, and whole species of animals and plants are disappearing from the planet at an alarming rate, threatening the biological diversity, our common heritage.
- Desertification and soil erosion threaten the agricultural land
- Urban Environments is degraded by air pollution, noise and increasing amounts of waste
- Coastal and marine waters are threatened by eutrophication and toxic wastes.

The majority of the scientists of the world fear that life itself as we know it today is severely threatened.

State of the Environment

In this situation it is of vital importance to analyze the present state of the environment. We have to find out where we are, to know where we want to go.

We all wish to improve the quality of our lives.
But we must see to that the economic growth is based on a healthy environment and a sustainable use of the

natural resources.
To ensure that our children will have a future, development must be sustainable.

On this background, The United Nations Environment Programme, UNEP, encourages all nations to make a status of their national environment. We must find out what has happened so far to our soil, water, forests, and the air in our cities. Then we must ask: What must be done to make the development sustainable?

The State Environment Protection Administration (SEPA) of the People's Republic of China has taken this challenge seriously, and now presents:

The State of the Environment China 1997

Goal

The Goal of this report is to give a tool for the decision-makers and the people of China that increases awareness of the environment, making it easier to assess the present dangers, take the right precautions in time, and steer the development in a sustainable direction.

Vision

The vision is that within the next decades, polluted and toxic rivers and waters will again be clear, the air will be clean and fresh to breathe, the soils will be fertile, the forests will grow and be healthy, and the natural resources shall be used in a way that ensures there is enough also for future generations.

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Notes:

- The statistics used by this report do not include those in Taiwan, Hong Kong and Macao except for those specifically noted.

Copyright:

Overview

The report gives an overview over the major

environmental issues in China. For more comprehensive information on the separate issues, the reader is guided to relevant libraries on the Internet or to relevant information sources.

Environmental indicators

An environmental indicator is meant to indicate the state or development of important aspects of the natural environment, what causes these changes, and how society responds to them.

Pressure - State - Response

This report is predominantly based on a cause- and effect chain, according to a Pressure - State - Response (PSR) concept.

Pressure: Human activities put pressure on the environment in different ways, e.g. through emissions of SO2 and NOx.
State: The pressure is reflected in an altered quality and quantity of the natural resources. E.g. increased acidity in fresh water.
Response: Society responds to limit these alterations or try to repair the damages on the environment. E.g . liming.

An environmental indicator steers action

The state of certain environmental indicators can be used to bring scientific findings from the field and lab to the general public and decision-makers.
To be effective, in the sense that the indicators steer action, the indicators should as a rule, have an explicit target group in a particular country or region in mind.

A set of indicators should not only give information on the development in specific environmental problem areas, but also give a general impression of the state of the environment. Ideally, a set of indicators is a means devised to reduce a large quantity of data to a simpler form, while retaining essential meaning for the questions that are being asked of the data.

Environmental indicators are used:

- to assess environmental conditions and trends on a national, regional and global scale;
- to compare countries and regions;
- to forecast and project trends;
- to provide early warning information, and
- to assess conditions in relation to goals and targets.

Isolated assessment is problematic

Information on the environment may be difficult to evaluate in isolation. In answering questions such as: how bad or good is the situation? Is it possible to do better?",etc, it is important to be able to compare the situation and development of various countries. Therefore, points of reference are needed. Preferably, a set of indicators for China should be the same as or closely related to the sets of indicators used in other countries.

Time series

It is also important to have the capacity to present long time series of the indicators. An early warning may be seen in changes in these time series. However, most of the processes at the basis of environmental degradation feature important time lags. These time lags separate opportunities for present action from the manifestation of effects, and sometimes last several generations. These delays are caused by a multitude of factors, such as gradual buffer depletion, long residence times of chemicals and slow transport in soils and groundwater. Everything may seem to function normally until, suddenly, the buffer zone becomes worn down.

Criteria for Indicator Selection

An environmental indicator should :

- provide a representative picture of environmental conditions, pressure on the environment or society's response;
- be simple, easy to interpret and able to show trends over time;
- be responsive to changes in the environment and related to human activities;
- provide a basis for international comparisons;
- have a target or threshold against which to compare it so that users are able to assess the significance of the values associated with it.

Analytical soundness

An environmental indicator should :

- be theoretically well founded in technical and scientific terms;
- be based on international standards and international consensus about its validity, and
- lend itself to linkage with economic models, forecasting and information systems.

Measurability

The data required to support the indicator should :

- be readily available at a reasonable cost/benefit ratio;
- be adequately documented and of known quality, and
- be updated at regular intervals.

(From OECD 1993c)

SoE China 1997

Dir General on Env.

Gifts
1
2 ?
3

Share interest in several related issues
e.g. energy + Env Z...

China - low per capita income
Predominant energy supply -> coal
per cap emis low

Development comes before env. challenge ☆
but China will not ignore GCC
sus dev in state policy
China working hard to readjust energy structure
-> hydro
clean + renewable energy
nat gas sub for coal in urban areas
Nationwide bio-friendly projects
tree planting s -> ↑ sinks ☆

China signed KP
responsible position to study CDM + trading ☆

Berlin Mandate must be strictly followed
China must study technicalities of trading ☆

Inter-ministry GCC task force
Natl. Leadership Group for CC
SDPC is lead
→ Ready for a dialogue

Liu found Growth target intriguing

Seeking to coop w/ US on CDM
Texaco agreement
Linking nat gas fields to Beijing
Strongly willing to maintain dialogue
w/ US. on GCC
attended KP

VM We know energy & env key on agenda
of Presidents
1st mtg understanding
- Don't sacrifice dev., don't grow
at expense of env.

2 overarching points of Chin. dev.
1) pop control
2) sus dev

fanatic of env + energy
funds w/ Secys of Ag (3)
Attended Rio

We have an right responsibility
as head of GFC task force
→ exec vice-chair
Signed all of Rio agreements

Promise to understand what we
have said on CCM + trading

I'll need experts to assess
what we have said
- How to calc emiss

SOPC - CEA relationship should
be a springboard to further
discuss these issues

Feel free to contact ____

In Honor of the Delegations to the First Meeting of the U.S. - China High-Level Climate Change Dialogue

The Chargé d' Affaires ad interim of the
United States of America
William C. McCahill, Jr.
requests the pleasure of the company of
Mr. Joe Aldy
at a Dinner
on Tuesday, September 1, 1998
at 7:00 p.m.

R.S.V.P.
6532-3831 Ext. ~~640~~ 6090

San Li Tun Ban Gong Lou 2-~~52~~ 51
三里屯办公楼2单元~~52~~ 51号

Mr. Joe Aldy
Sēnior Economist
Council of Economic Advisers

intro Dr. Keller

AEA
modest costs – grow econ + protect env – sus dev
active private sector
- flex to take adv of CDM, trading
- interest by private sector

Create an intl mkt in emis allowances

~~China~~

Key is designing institutions

Opportunities for China / low cost in China $/GDP
energy – $300 b over 20 yrs elect. gen
sinks – double forests over 50 yrs

CDM, trading – create mkt
countries w/ comparative adv gain
export industry for China

---

1) draw investment
2) export allowances
3) ↓ GHG
4) ↓ PM, SO_2
improve air quality

Liu

Conveys best wishes to Janet
Participated in R.10
Agenda 21 document

Dir Gen SDPC
Development key issue
attach great imp't to env prot
★ made great efforts to slow growth of GHG
energy cons is a priority for energy policy
want ↑ energy eff, renewables
opportunity to conduct econ modelling together
" for cooperation on GCC issues

MOFA
coal

Project cooperation
China already has a large amt of research - policy + tech.
★ GHG forecast + modeling

Civ

pop + GCC

→ calc emis of a given pop, then if pop growth slowed, emis red would be X

forestry efforts

Leb RMB over next 2 yrs

will contact Treas re: gov fiscal policies to address GCC

Call Todd/Jonathon

China - efforts to ↓ emissions likely thru ↑ efficiency + competition
push for competition/privitization
reduce financial subsidies
back-tracking on housing privitization
Raising energy prices
coal - could ↑ prices for utilities, leave same for res. use

Carbon emissions
#3006 over now → 2015 cut emissions 9% in 2015
(based on Chinese official plan w/ modifications)
(N) market

Korea
no strong domestic constituency for env prot, energy efficiency
don't see real benefits to GCC commitment
modest recovery in 1999, env growth 5-6% 2000 →
50% 1995-2000, then 50% again 2000-2010
CO_2 emissions (1995: 100 mmt, 2010: 217 mmt)
control emissions
→ Korean industry drives emissions
less efficient than US, but similar pattern of energy use
AQ + WQ problems
GCC is a problem, but not their problem
claim to be 12th in OECD in CO_2 emissions
Contacts: Su
Haesung Lee

SCENESETTER FOR CHINA: CLIMATE CHANGE

BACKGROUND

U.S.- Sino relations, never without frictions, are nonetheless in a potentially propitious stage where we could begin to form a more strategic partnership in a number of areas. The purpose of your engagement with key Chinese officials on the economics of Climate Change is to promote a better understanding of how the flexibility mechanisms (e.g. the Clean Development Mechanism and international emissions trading) can reinforce China's macroeconomic growth plans while meeting the broader goal of mitigating the threat of Climate Change.

The U.S. and China are the world's two largest greenhouse gas emitters -- and China is projected to surpass the U.S. early in the next century. Clearly, China needs to play a leadership role among developing countries in adopting a "clean growth" strategy, if we are to be successful in addressing this problem. Given China's size and long-term growth prospects, it is in U.S. interests to encourage a reassessment of China's obstructionist position in the Climate Change negotiations, by highlighting the potential for closer U.S.-Chinese cooperation on Climate Change with a view toward building a partnership that improves China's understanding of how a market-based regulatory system can help them achieve both environmental and developmental goals.

With the key leaders you meet you need to underscore the need for partnership, our joint responsibility to act, and our interest in discussing various approaches (investment through the CDM and international emissions trading) with them.

To set the tone you might want to reinforce these "partnering" ideas with some of these thoughts.

- China and the U.S. are working together on a number of international issues, such as most recently in the nuclear proliferation problems in South Asia. The Secretary of State, in her recent visit to China, underscored that we should find ways of cooperating more closely on a range of international issues, including long-term challenges like Climate Change.
- Given our unique positions in terms of national greenhouse gas emissions, U.S.-Chinese cooperation makes sense. A better understanding of how flexibility mechanisms can work to promote clean growth in China and ensure we achieve the environmental goals of Kyoto is our objective.
- We have begun a dialogue on environmental issues in the context of the Environment and Development Forum. We believe we should broaden these exchanges and explore how to cooperate more effectively on problems such as Climate Change.
- My role in the U.S. government is to ensure we understand the economic implications of policy decisions. No government, not China, not the U.S. can undertake policies that stop growth -- even for environmental objectives.
- In fact, we have been working hard in the U.S. to "grow the economy, and protect the environment". We believe our growing understanding of "regulatory markets" (market-based regulatory systems) can be as important as U.S. technology in helping achieve both growth and environmental objectives.
- I would like to share some of our thinking with you and begin an exploration of how China can benefit from the Clean Development Mechanism and ultimately a global emissions market.

Ministry of Foreign Affairs

Land Div. SDPC — China Met. — MFA — head of Kyoto del. — China Agenda 21 — dep dir Law + treaty MFA

Yin

GCC under Law + treaty dept of MFA

China has interagency committee on GCC

chaired by Zang Peiyan, SDPC

China needs to cooperate w/ G-77, but interested in bi-lat talk

Chinese concerns

1) recognize US interest in sinks, trading, CDM, emis forecast

2) Chinese concerns

- implementation w/ differentiation
- how to ensure developing countries achieving sus dev
- how to enhance capabilities of developing countries in addressing + adapting to GCC
- tech transfer mechanism from A1 to non A1
- how to dev new tech, and how A1 can work w/ non A1 in dev technologies
- A1 assistance to non A1

Dialogue for morning

- U.S. views on GCC
- Chinese views on issues impt to US

Kimble

strategic partnership needs to recognize domestic concerns in both

GCC policy requires changing how we power our economies

Econ growth essential for all economies

US experience in dom envl prot. for 40 yrs

global envl probs require global cooperation

Kimble

experience w/ global (and Sino-US) cooperation - Montreal Protocol
recognize differentiation + need for econ growth + sus dev
KP key milestone for intl community
- comprehensive of sources + sinks
  this allows us to address other envl issues + GCC simultaneously
  eg reforestation that would benefit watersheds, habitat + GCC
- 2 flex mechs are critical to success of KP
  CDM - incentive for investment in tech for env.
  emis trading - innovative + controversial
    US experience - SO_2 cost-effective + envl gains
  our assessment after Bonn is that it will take 1½ - 2 yrs
    to develop rules on CDM + trading
  should not foreclose options in B.A., eg caps on trading
Need cooperation b/t US + China
US has very active domestic effort
Sino-US cooperative efforts - energy use → clean energy, renewables

Yin

have some common positions, some different positions
differentiation
  GCC still needs to be resolved accurately by scientists
  bc of GHG emis over last century, GCC is developed world responsibility
    luxury emis v. survival emis
      A1 non A1
  per capita emis are low in developing countries
  China is still a poor country - impossible for China to reduce GHG
  China will, along sus dev strategy, address GCC

Yin

4 categories of measures in China to address GCC
- try to control pop growth rate (goal is 1.5 by mid 21st C) plan to join developed countries then
- upgrade efficiency of energy use - 3.6%/yr efficiency improvt 1981-1990
  5.9%/yr " 1991-present
  better than US, but recognize higher E/GDP in China
  ∴ consider tech transfer very impt.
- consider renewables very impt - (N), hydro, wind, solar
  problems w/ tech + capital availability
- expanding afforestation + ecological ag → identical to US position

China's economy will grow, GHG will grow as well, ∴ can't restrict GHG emis
but is trying to abate GHG growth rate
Hope for more cooperation w/ developed countries - tech transfer + capital assistance
Questions
1)
2) how to ↑ capability of developing countries to address GCC + sustdev
What is imminent in intl forum is not pressure for developing countries
to reduce emissions, but to ensure sus dev
China govt recognizes key role of envl prot in development
upgrading of state bureau of envl prot to SEPA indicates govt concern
Key to tech transfer + capital assistance (concessional conditions)
3) dev of new tech + tech transfer
attach impt. to dev of new technologies
pop: ↓ by A1 could be offset by non A1 pop growth
w/o new tech, can A1 reduce GHG?
to what extent can non A1 contribute w/ tech transfer + capital asst.
hope developed countries dev + transfer new tech to developing countries
developed countries have not transferred enough tech - we're disappointed
China has provided to COP demand for tech (1.5)

Yi

China hopes A1 will develop a tech transfer mechanism as soon as possible
interested in project cooperation w/ US - want US to be more open to tech transfer + Cy. tal assistance

Liu

China + US have similar position on sinks
China flexible on land + forestry activities
Re flex mechs - ongoing study in China
CDM easier to understand than trading, ∴ more study on CDM
trading more complicated - needs longer term study
CDM - dual goals in KP should be reflected, but a difficult
- is project-based + voluntary
- CDM should not fully replace tech trans + capital ass't in FCCC
- do not want large intl bureaucracy
- prefer bi-lat projects over multi-lat
Qs for US
- how does US see the 2 goals of CDM + how to achieve them?
- does US prefer bi-lat or multi-lat projects?
- what is US view of exec board + its role?
- how will A1 countries acquire CERs?
- how does the US understand "part" in CDM?
- which is more attractive to US - CDM or trading?
- how does US see trading, esp given opposition to hot air + deficit selling?

Kimble

on sinks, since IPCC will address issue, concrete decisions @ COP4 appear difficult
econ growth, intl efforts on GCC, and long-term political support
stabilizing + reducing [GHG] will require new tech
KP can be met w/ existing tech + flex mechs - copy of AEA
CDM offers new way for private sector to be active part of solution
tech dev is driven by incentives, and private sector is the creator + transferer of tech

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GLOBAL
ENVIRONMENT
FACILITY

China

Efficient Industrial Boilers

Project Document
November 1996

THE WORLD BANK

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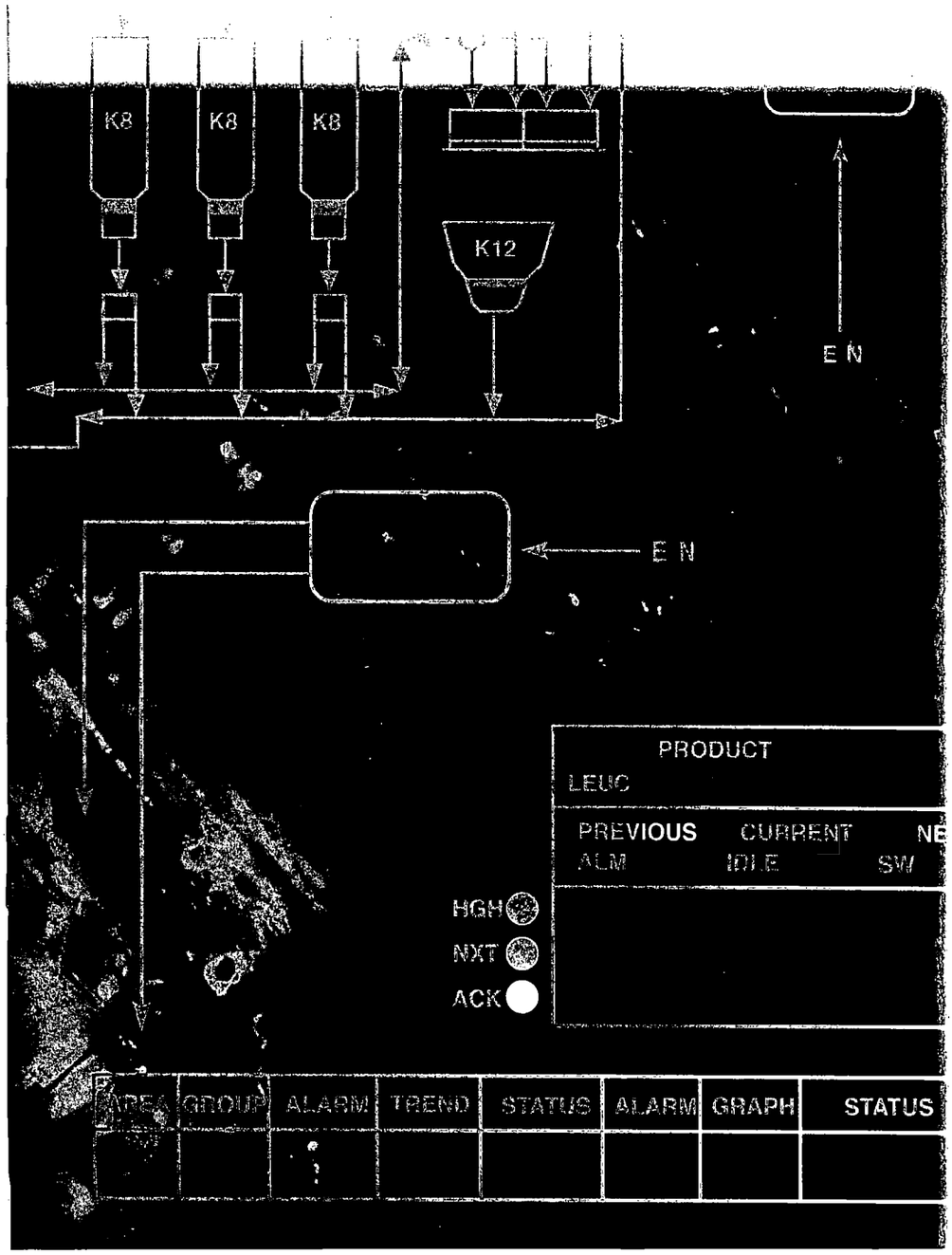
Honeywell

Honeywell *In China*

霍尼韦尔在中国



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HONEYWELL IN CHINA

霍尼韦尔在中国

KEY JOB REFERENCES

重点工程项目

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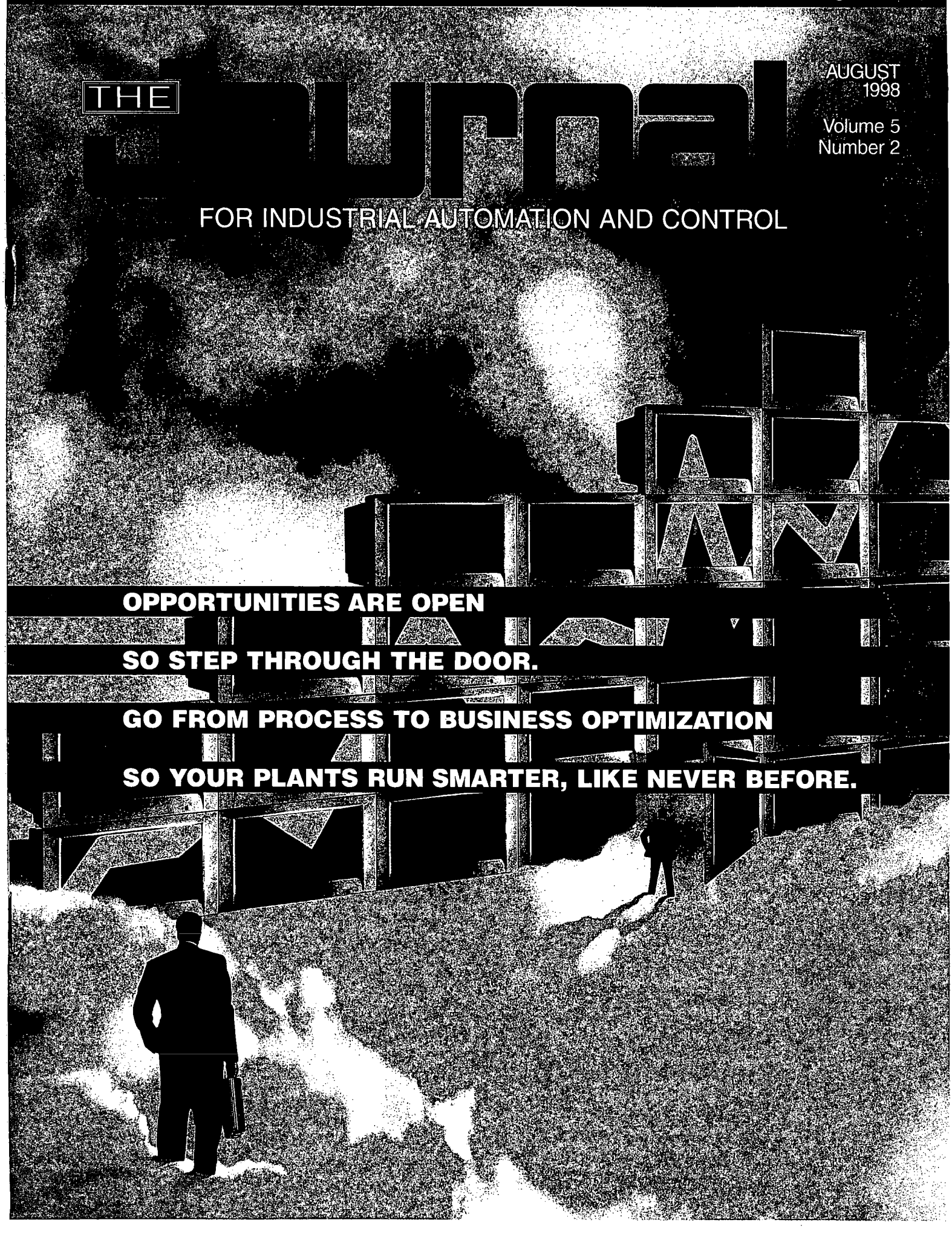
THE Journal

AUGUST
1998

Volume 5
Number 2

FOR INDUSTRIAL AUTOMATION AND CONTROL



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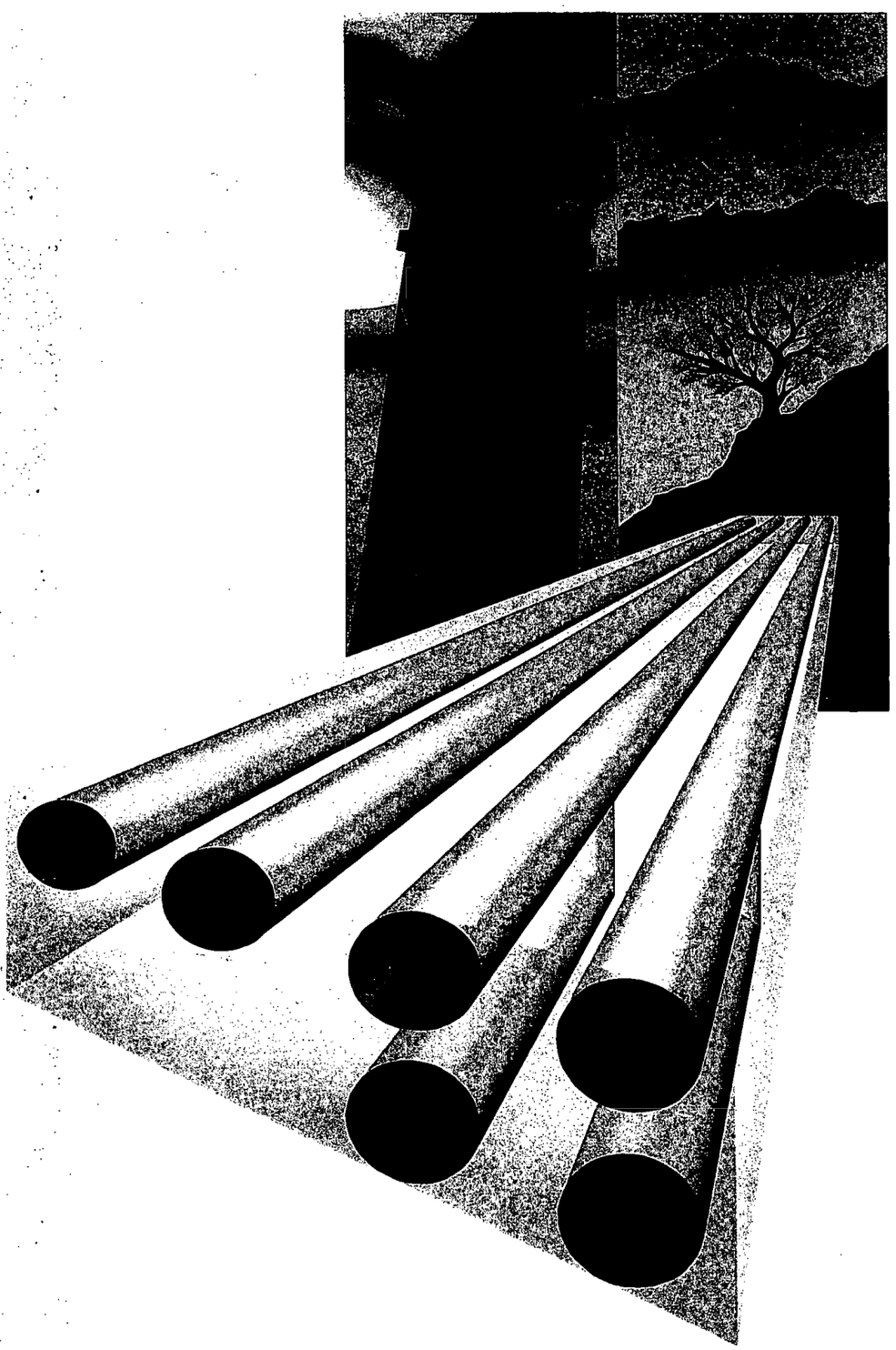
Complete control solutions for District Heating



13th International General Assembly
GLOBE USA
Cape Cod, Massachusetts
August, 1998

ENERGY AND CLIMATE CHANGE: CHALLENGES FOR CHINA IN THE NEXT CENTURY

Mr. Zhaodong Liu
Minister-counselor for Science & Technology
Chinese Embassy

As the largest developing country, to keep the rapid economic growth and reduce poverty is the top agenda for the Chinese people. China is the second largest energy user in the world - consuming 1.4 billion tons of coal a year which supplies about three fourth of the country's total energy needs. And coal will remain its most important and leading energy supply, at least in next few decades.

Energy use inefficiency is still the biggest problem which has been addressed by the Chinese government in the past two decades. Consuming coal at low efficiencies with backward technology and not enough emissions control measures is causing very severe air pollution and health problems in urban areas. Actions are being taken by the Government to address energy and environment issues.

The Chinese government takes climate change issues very seriously. The official position with regard to greenhouse gas emissions control is declared clearly: China will take and continue to take concrete measures to mitigate the domestic emissions; but it will be a big challenge for Chinese people to reduce the greenhouse gas emission amount in the near future due to its economic development and heavy dependancy on coal as the main energy resource. It is possible to reduce the growth rate of emissions with assistance from the international community.

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COAL MINES INDUSTRY TO BE RESTRUCTURED AS PRICES FALL

China to shut 22,000 pits

By James Kynge in Beijing

China, one of the world's largest coal producers, is to close some 22,000 mines by 2000 in a bold move to restructure an industry hit by chronic oversupply and weakening demand.

The plan, reported by the official media yesterday, provides a disturbing insight into the extent of China's economic slowdown. Coal contributes about 75 per cent of its energy needs, but output fell 7.8 per cent to 539.7m tonnes in the first half of the year compared with the same period a year ago.

Officially, gross domestic product climbed an annualised 7 per cent in the first half of the year, down from 8.8 per cent for the whole of 1997. But, according to statistics released yesterday, total energy output fell 5.5 per cent in the first six months compared to the same period a year ago.

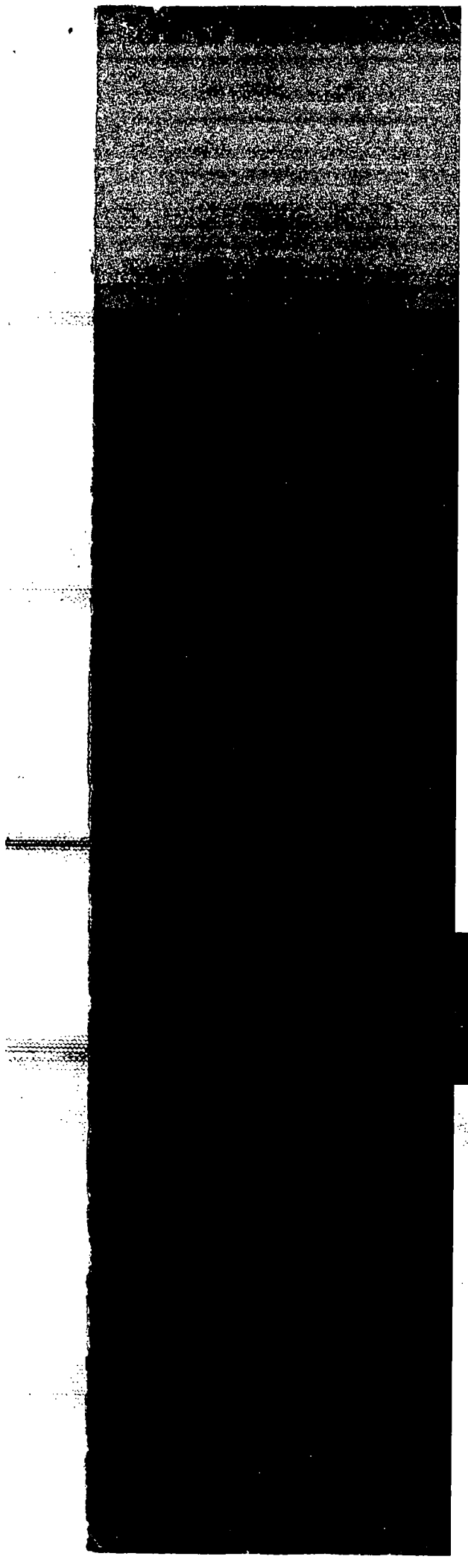
The new statistics appear to support the arguments of some economists who say that China's headline growth figures paint too rosy a picture. "It is difficult to understand how we can have 7 per cent. growth, when the energy to fuel that growth is down by nearly as much," said a Chinese stockbroker.

The plan to restructure the coal industry is the latest of several signs of economic decline. Most closures are expected to come from among about 75,000 smaller pits run by township and village enterprises. Although these are sometimes unlicensed and less efficient than the 2,500-plus state mines, they produce more than a third of national output, officials said.

The closures are necessary to cut annual production by 200m tonnes and balance supply with demand, the official China Daily newspaper quoted Wang Xianzheng, deputy director of the State Coal Industry Bureau, as saying. Total output in 1997 was 1.33bn tonnes.

The restructuring was primarily aimed at reversing a sharp fall in coal prices and boosting profitability at big state mines. The 94 main state coal companies had a combined loss of RMB1.75bn ($211m) in the first half of this year, compared with a RMB200m profit during the whole of 1997.

Domestic stockpiles rose 9.35m tonnes in the first six months of the year to 65.3m tonnes.



Our Real China Problem

by MARK HERTSGAARD

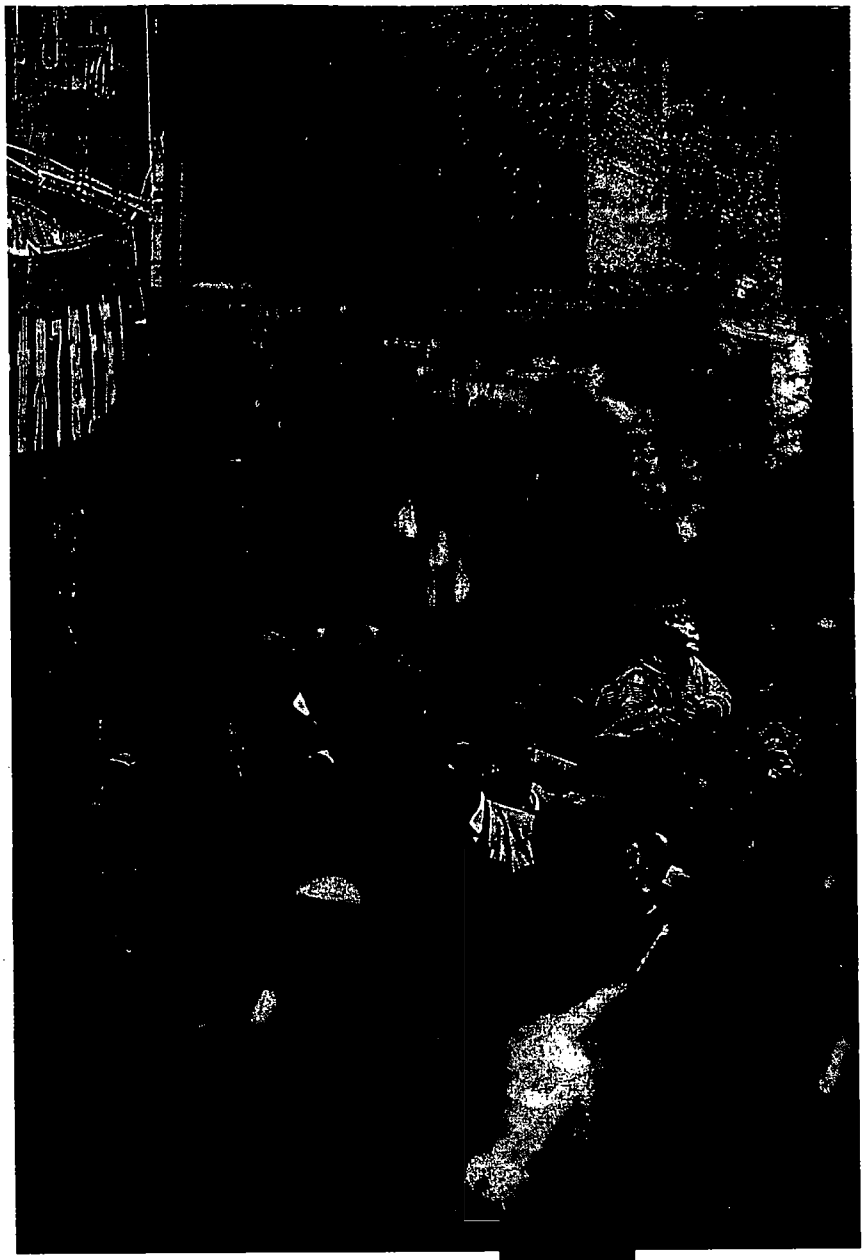
The price of China's surging economy is a vast degradation of the environment, with planetary implications. Although the Chinese government knows the environment needs protecting, writes the author, who spent six weeks inside China investigating the growing environmental crisis, it fears that doing the right thing could be political suicide

CHONGQING, the Yangtze River city that Americans may know as Chungking, is a naturally foggy place. It also suffers some of the worst pollution in all China, which puts it among the strong candidates for most polluted city in the world. When the fog and the pollution are both at their thickest, locals say, "if you stretch your hand out in front of your face, you cannot see your fingers."

Visibility was somewhat better than that when I visited Chongqing one morning recently. Perched high above the Jialin River, which also flows through the city, I peered into the dank grayness before me. I could dimly make out a black-and-white tugboat hugging the far shore of the river and, beyond that, the outlines of what might be office buildings. This was the view from the back of the Chongqing Paper Factory, a massive state-owned facility that local environmental officials had singled out as evidence of how well they were cleaning up Chongqing. Built in the 1940s, the factory had been for a long time a terrible polluter, discharging enough chlorine and other toxic chemicals into the Jialin "to cover the entire river with white foam," according to a top official of the Chongqing Environmental Protection Bureau who must remain nameless. Now, however, the official bragged in an interview, the factory had been all but shut down. "Our strategy has been to press them to death!" he said.

Early morning in Beijing

Photographs by Jeffrey Aaronson/Network Aspen



Seeking elbow room, Shanghai

At the factory, though, it didn't look that way. The official discouraged me from trying to visit ("I myself would have to seek permission to enter," he said scoldingly), but Zhenbing, my interpreter, and I found the front gate open when we arrived, and since no one stopped us, we simply walked in. At the back of the plant a set of concrete steps led down to the Jialin River, perhaps eighty yards below. Halfway down Zhenbing and I cut left across the exposed riverbank, our shoes leaving clear prints on the dark, sandy soil.

Within seconds we saw a broad stream of bubbling water cascading out the back of the plant and down the hillside. The astringent odor of chlorine attacked our nostrils, and once we reached the stream's edge, the smell was so powerful that we immediately backed away. Below us, where the discharge emptied into the Jialin, a frothy white plume was spreading across the slow-moving river.

Fifty yards farther on we encountered a second stream, this one a mere foot wide but clogged with pineapple-sized clumps of dried orange foam. Beyond was a third creek. Its stench identified it as household sewage (workers in China's state-owned factories generally live on site or nearby), but its most extraordinary feature was its color—as black as used motor oil. Not ten yards away a grizzled peasant in a dark-blue Mao jacket and trousers (an outfit still worn in China by the poor) bent over a tiny vegetable patch to pick some greens for his midday meal.

All this was dwarfed by what lay ahead. The vapor was what we saw first —wispy white, it hung low in the air, like tear gas. Stepping closer, we heard the sound of gushing water. Not until we were merely footsteps away, however, could we see the source of the commotion: a vast, roaring torrent of white, easily thirty yards wide, splashing down the hillside like a waterfall of boiling milk.

Again the scent of chlorine was unmistakable, but this waterfall was much whiter than the first. Decades of unhindered discharge had left the rocks coated with a creamlike residue, creating a perversely beautiful white-on-white effect. Above us the waterfall had bent trees sideways; below, it split into five channels before pouring into the unfortunate Jialin. All this and yet the factory, as one worker had informed us, was operating at about 25 percent of capacity.

Hoping to leave the factory grounds by another exit, Zhenbing and I were trudging up a service road when a man wearing the olive-green greatcoat of the Chinese military came running directly at us. It seemed that our unauthorized factory tour might end badly after all. But no. Military greatcoats turn out to be a bit like Mao jackets in China these days: lots of people wear them, because

WHAT HAPPENS IN CHINA IS CENTRAL TO A GREAT QUESTION OF OUR TIME: WILL HUMAN CIVILIZATION SURVIVE THE ENVIRONMENTAL PRESSURES CROWDING IN AT THE END OF THE TWENTIETH CENTURY?

they are cheap and functional. In any case, this man had different worries. Liquid was spilling from two large, loosely connected hoses by the side of the road, one leading back up to the factory and the other stretching down to the river. The man barked orders at two workers straddling the hoses, and they stepped back. Then, without a word of warning to Zhenbing and me—though we were standing only five feet away—he knelt and tightened the connection between the hoses.

Instantly he was engulfed in an explosion of gas. But he was ready for it, and in one fluid motion he straightened and started sprinting back along the road, vanishing behind the billowing cloud of chlorine after two steps. Zhenbing and I were not ready for it, but forward was the only way out, so we held our breath and plunged after him. Six running strides brought us past the worst of it, but even then we were surrounded by huge puffs of gas, which started us coughing fiercely.

Thirty yards up the road we were still sputtering when we passed three dump trucks parked against the factory wall. A dozen workers were lounging in the backs of the trucks. The man in the greatcoat, who had run all the way here, was bending down to tie his shoe. Chlorine is the chemical that was used to kill soldiers in the poison-gas attacks of the First World War, but the men in the trucks showed no concern about the vapors floating past their heads. They only elbowed one another and stared at the foreigner trudging past their factory—evidently a far more unusual sight.

Zhenbing and I walked in silence to the plant's side exit and left. We were in the middle of a six-week trip through China to investigate the environmental crisis, and it was not a cheering assignment. In Beijing, Xi'an, and other cities of the north Zhenbing and I had walked in air so thick with coal dust and car fumes that even sunny days looked overcast and foggy. In the bone-dry province of Shanxi, a day's journey west of Beijing, we had ridden by train for hours without seeing anything that resembled woods—there were only a few scattered, spindly trees, which looked ready to expire any minute. Everywhere, it seemed, the land had been scalped, the water poisoned, the air made toxic and dark.

Despite witnessing all this, Zhenbing was not exactly a militant environmentalist. Born into a very poor rural family thirty years ago, he, like most Chinese I had met, was quite willing to put up with filthy air and polluted water if it meant more jobs, better pay, a chance to get ahead. But today's experience had shaken my new friend. Outside the factory we were waiting for the bus back downtown. I was scribbling in my notebook when, behind me, I heard Zhenbing murmuring, as if in a dream, "My poor country. My poor country."

The "Soft-Law" Syndrome

HUMAN rights, China's possible admission to the World Trade Organization, its alleged Washington influence-buying—these are the issues that have made international headlines in the months leading up to this fall's Sino-U.S. summit. But soon China's environmental crisis is bound to command equal attention. China claims that its population is 1.22 billion people (as of the end of 1996). The true number is certainly higher than that. But even the official figure means that nearly one out of every four human beings on earth lives in China. The Chinese economy is ranked anywhere from the third to the seventh largest in the world, and is expected to be No. 1 by 2010. Incomes have doubled since Deng Xiaoping initiated his marketplace reforms in 1979, and the environmental side effects have been devastating.

At least five of the cities with the worst air pollution in the world are in China. Sixty to 90 percent of the rainfall in Guangdong, the southern province that is the center of China's economic boom, is acid rain. Since nearly all the gasoline in China is leaded (Beijing switched to unleaded gas in June), and 80 percent of the coal isn't "washed" before being burned, people's lungs and nervous systems are bombarded by an extraordinary volume and variety of deadly poisons. One of every four deaths in China is caused by lung disease, brought about by the air pollution and the increasingly fashionable habit of cigarette smoking. Suburban sprawl and soil erosion gobbled up more than 86 million acres of farmland from 1950 to 1990—as much as all the farmland in Germany, France, and the United Kingdom. Farmland losses have continued in the 1990s, raising questions about China's ability to feed itself in years to come, especially as rising incomes lead to more meat-intensive diets.

Even the government's official policy pronouncements, which invariably overaccentuate the positive, admit that environmental degradation in China will get worse before it gets better. For China's newfound wealth has only whetted its citizens' appetite for more. China's huge population wants to join the global middle class, with everything that entails: cars, air-conditioners, closets full of clothes, jet travel. Rising consumer demand has already resulted in chronic widespread electricity shortages. Thus China plans to build more than a hundred new power stations over the next decade, adding 18,000 megawatts of capacity every year—roughly the equivalent of Louisiana's entire power grid. By 2020 its coal consumption will have doubled, if not tripled. All this will not only worsen the country's acid-rain and air-pollution problems; it will endanger the entire planet, by accelerating the global warming that scientists say is already under way.

China's huge population and grand economic ambitions make it the most important environmental actor in the world today, with the single exception of the United States. Like the United States, China could all but single-handedly make climate change, ozone depletion, and a host of other hazards a reality for people all over the world. What happens in China is therefore central to one of the great questions of our time: Will human civilization survive the many environmental pressures crowding in on it at the end of the twentieth century?

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YOU DON'T ALLOW THEM IN YOUR CAR.

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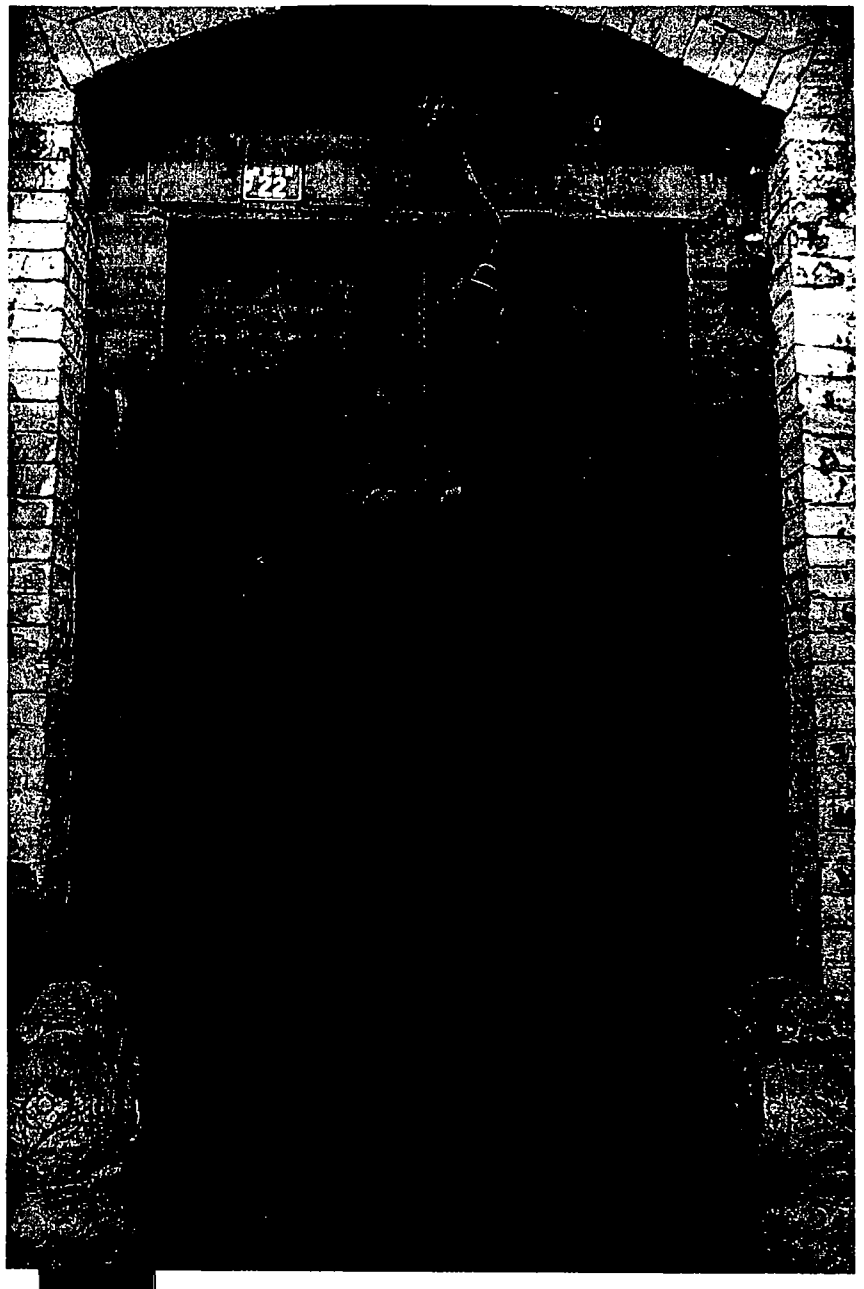


A coal supply in Beijing

Like governments the world over, China's leaders have learned to say the right things about the environment. In 1992 China was an enthusiastic participant in the United Nations Earth Summit. In July of last year President Jiang Zemin and Premier Li Peng began to speak out against environmental destruction and to urge a shift toward "sustainable development." China has also adopted comprehensive environmental laws and regulations that on paper compare favorably with—indeed, were often modeled on—their Western equivalents.

But the future is shaped less by official rhetoric than by what actually happens on the ground, and as the Chongqing Paper Factory illustrates, environmental laws are often simply not implemented in China. This is no state secret; most of the dozens of government officials I interviewed acknowledged the pervasiveness of the problem, often without prompting. Sometimes the culprit is corruption: factory owners use *guanxi*—personal connections—or bribery to get local regulators to look the other way. Beijing either can't or won't stop them. As the ancient Chinese adage says, "The mountains are high, and the Emperor is far away."

Even more common, and intractable, is the so-called soft-law syndrome. Under soft law the government excuses state-owned companies from full compliance with environmental laws and standards; the law is "softened" in order to spare the companies (and the state banks supporting them) from bankruptcy and to shield their workers from unemployment. In contrast to corruption, soft law is not something Chinese officials like to talk about.

Right after the explosion at the paper factory I had lunch with Hu Jiquan, a top government economist in Chongqing. Keen to encourage foreign investment, Hu was pledging that the local environment would improve in years to come, thanks to tougher law enforcement. "We will close factories if we have to," Hu said. "We've already closed more than two hundred of them." Having just returned from the chlorine waterfall, I couldn't help challenging this rosy vision, and Hu was honest enough to concede that short-term economic considerations often do override environmental goals in China. "The trouble is, if we close that factory, many workers will lose their jobs, and our government would rather support the workers than protect the water," he said with a shrug.

EIGHTY PERCENT OF THE COAL IN CHINA ISN'T "WASHED." ONE OF EVERY FOUR DEATHS IN CHINA IS CAUSED BY LUNG DISEASE, BROUGHT ON BY THE AIR POLLUTION AND BY THE HABIT OF SMOKING.

Hu then extended his explanation, though he first told Zhenbing not to translate this part for the foreigner. The government of Chongqing knew perfectly well that the paper plant should be closed immediately. In fact, it had tried to shut the plant months earlier (just as the unnamed official quoted earlier had bragged), "but the local peo-

ple and leaders complained a lot, so the government backed off. It was afraid of social unrest."

This is the crux of the Chinese environmental problem. The government knows the environment needs protecting, but it fears the social consequences. Bluntly put, it worries that doing the right thing environmentally could be political suicide.

A Long Nightmare of Deprivation

THE government would like to protect the environment for a very simple reason: senior officials have come to realize that environmental degradation costs money—indeed, it threatens to derail China's entire economic-modernization program. Li Yining, a grand old man of market economics, who was one of the masterminds of China's transition to private enterprise, told me in an interview that "inadequate ecological protection" was one of the few things that could prevent China's economy from growing at 10 percent a year "for a very long time." Acid rain, for example, causes $2.8 billion worth of damage to forests, agriculture, and industry in China every year. Air pollution raises health-care costs and lowers workers' productivity. Deforestation worsens the floods that already kill thousands of Chinese every year. The list goes on. The official *China Daily* estimates that the annual cost of China's environmental degradation is seven percent of the gross domestic product. Vaclav Smil, a geographer at the University of Manitoba and a leading expert on China's environment, calculates the cost at no less than 10 to 15 percent of GDP. If Smil is correct, then the much-celebrated growth of China's economy is, in effect, being canceled out by associated environmental degradation. In short, the economy is running hard but poisoning its own future. The problem, of course, is that faithfully implementing environmental laws would require closing hundreds of thousands of factories and throwing tens of millions of people out of work.

The Chinese people have long and bitter experience with scarcity and are understandably eager to leave it behind. As recently as 1949 life expectancy was only thirty-nine years, a level not seen in Europe since the Industrial Revolution. All Chinese over forty have firsthand memories of the greatest man-made disaster of the twentieth century, the famine caused by Mao Zedong's Great Leap Forward campaign. As Jasper Becker, the Beijing bureau chief of the *South China Morning Post*, documents in *Hungry Ghosts* (1997), the famine killed some 30 million people from 1959 to 1961 and brought starvation, misery, and even cannibalism to rural China.

Today the average Chinese life-span is about seventy years, yet scores of millions still live in desperate poverty. In one village I visited in Sichuan province, on a very cold day when my feet were only just comfortable inside heavily insulated hiking boots, I watched a grim-faced peasant woman washing her family's clothes in the river, her bare feet dangling in the frigid water. On the other side of the village a man, also barefoot, stamped around on a pile of loose, moist coal, looking like an eighteenth-century European peasant crushing grapes for wine. In fact he was manufacturing the briquettes of fuel whose carcinogenic combustion would provide what little heat he and his neighbors enjoyed in their windowless mud huts.

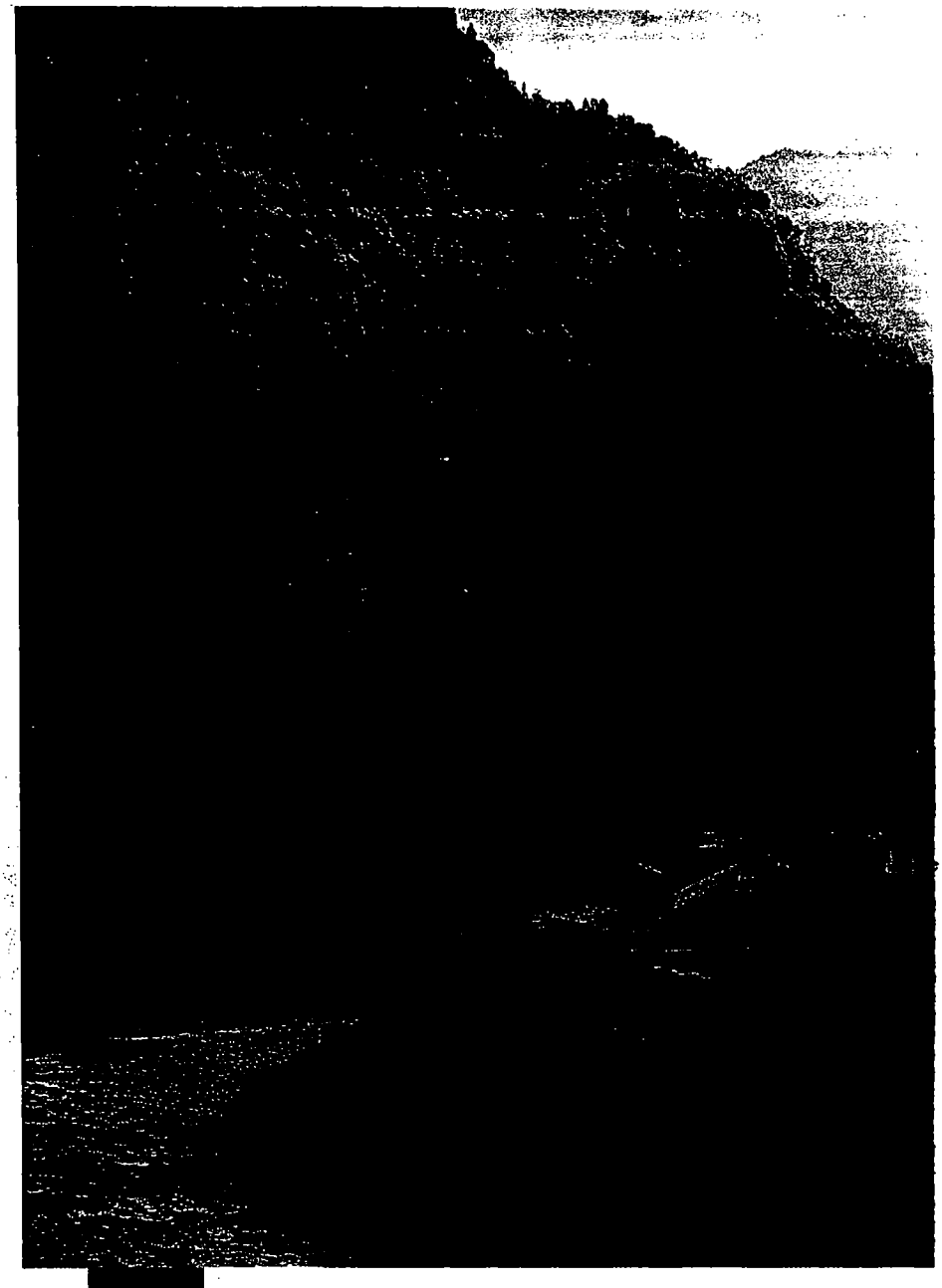
Now that China is at last awakening from its long nightmare of deprivation, the Communist Party's tattered legitimacy depends on keeping the economic expansion going, and extending it to the many regions that still lag behind. Yet the marketplace reforms that have sparked double-digit economic growth in China have also brought pain to vast portions of the population. As a result, there has been much more social unrest in China in recent years than most outsiders realize. The mass occupation of Beijing's Tiananmen Square in 1989 and the army's subsequent massacre of unarmed demonstrators are well known. But similarly militant protests took place at the same time in cities and towns throughout China; that news did not reach the outside world because there were no foreign journalists on hand to report it. Recently, as the transition from state-organized economy to private-market free-for-all has touched the lives of more and more Chinese, thousands of wildcat strikes and street demonstrations have occurred across the country, especially in Manchuria, a bastion of heavy industry, where unemployment rates now exceed 30 percent. WE DON'T WANT DEMOCRACY, WE WANT TO SURVIVE, declared one protest banner in the city of Shenyang.

All this has left Party leaders determined to keep the economy growing no matter what. They believe that Tiananmen Square was not primarily about politics—about the issues of democracy and human rights that dominated Western news reports—but about economics. There is truth to this. Hundreds of thousands of average Chinese followed the students into the streets not only because they yearned to breathe free but also because they were angry about hyperinflation, corruption, and their own uncertain economic prospects. The Party saw its life flash before its eyes in 1989, and it got a second warning in 1991, when its erstwhile "big brother," the Communist Party in the Soviet Union, fell from power. The Chinese Communists are determined not to suffer the same fate. As Deng Xiaoping warned his fellow Party leaders after Tiananmen Square, if the Party cannot improve the welfare of the people, the people will go into the streets.

Environmental Revolts

BUT there is a Catch-22. The people, it seems, will also go into the streets if their local environment becomes intolerably polluted—if, for example, they are deprived of safe drinking water.

"There were social revolts along the Huai River, so the State Council [China's Cabinet] *had* to react," one retired senior government official told me, recalling the most dramatic government crackdown on pollution to date. The



Industrial pollution in rural Sichuan and urban Shenyang

Huai region, located about 200 miles northwest of Shanghai, is the most densely populated of China's seven major river basins: 110 million inhabitants share 108,000 square miles of land. The river had been severely polluted for years, but it got drastically worse in July of 1994, when a sudden flood of toxins turned the river black and deadly for weeks. Hundreds of thousands of people were left without drinking water, several thousand were treated for dysentery, diarrhea, and vomiting, and 26 million pounds of fish were killed.

Popular outrage took many forms, including pelting local officials with eggs when they blocked foreign journalists from filming the river. The most extraordinary moment came when a top leader from Beijing, Song Jian, the elderly chairman of the State Council's environment committee, arrived to inspect the site. Somehow one brave and resourceful peasant managed to give Song a glass of river water to drink. Song took a sip of the putrid brew; then he turned to the local and provincial officials flanking him and shrewdly invited them to drain the glass. These officials had ignored earlier pleas to close the paper, leather, and dyeing factories whose waste fouled the Huai. Song told them they would be sacked if the offending factories were not shut promptly. Last summer the government closed 999 paper mills and untold numbers of other factories.

If Beijing fears social unrest so much, why did it shut all those factories? One reason, said the retired senior government official, was that "for years no boy from [certain villages in] the Huai River area has been healthy enough to pass the physical examination required to enter the army." Even more important, said other observers, these factories were "township and village enterprises," or TVEs—small, privately owned plants that employed no more than a few dozen workers each. TVEs employed at most tens of thousands of moonlighting peasants who had never stopped working in their fields. Against that fact the government had to weigh the anger of the many hundreds of thousands of people who relied on the Huai for their drinking water—people who had already demonstrated a capacity for protest. There was no question which group should be placated.

FEW SCATTERED, SPINDLY TREES LOOKED READY TO EXPIRE ANY MINUTE. EVERYWHERE, IT SEEMED, THE LAND HAD BEEN SCALPED, THE WATER POISONED, THE AIR MADE TOXIC AND DARK.

Beijing went national with the campaign against TVEs in August of last year, when the State Council ordered some 60,000 heavily polluting factories to close. "That sounds like a big number, but in a country as large as China it amounts to only one percent of the total number of enterprises and workers," Ye Requi, a deputy administrator of the National Environmental Protection Agency, told me. Ye nevertheless argued that the closings "show the seriousness of the

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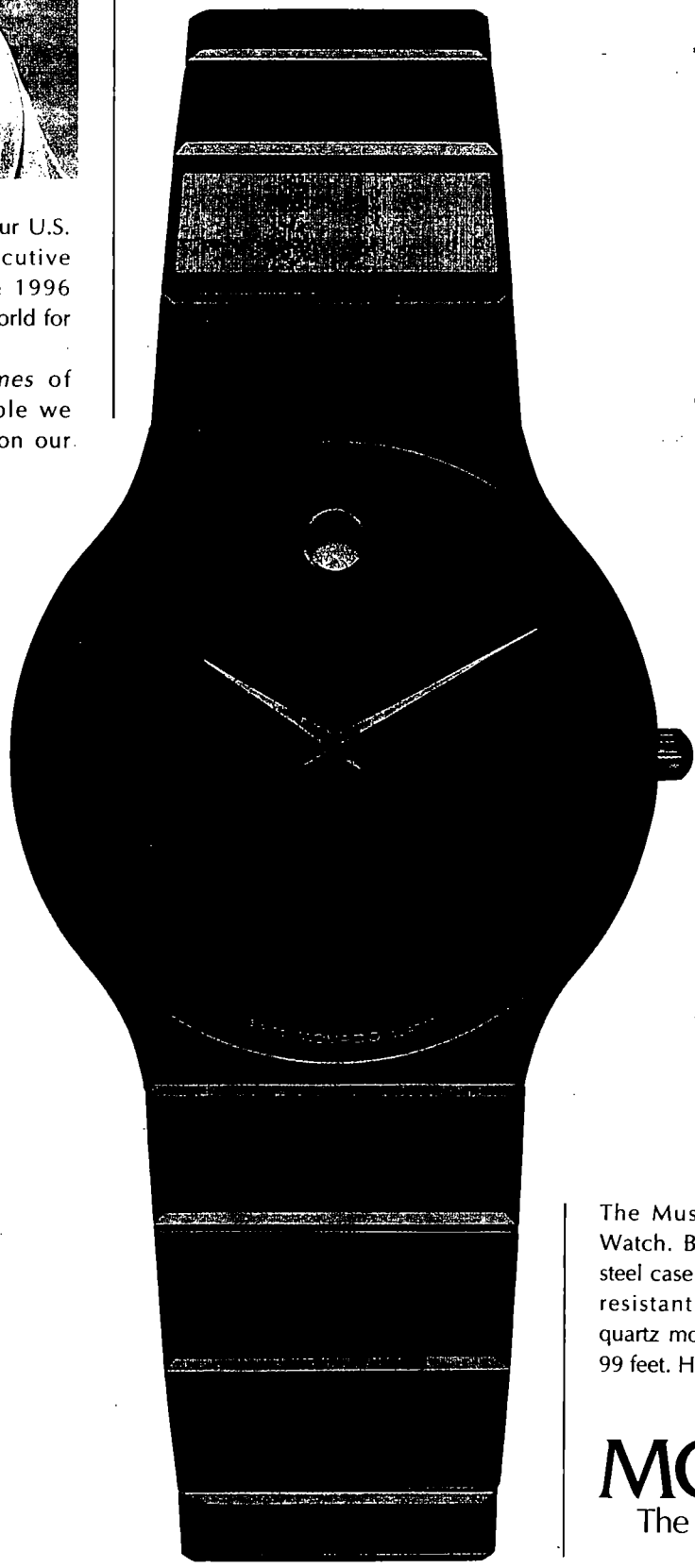

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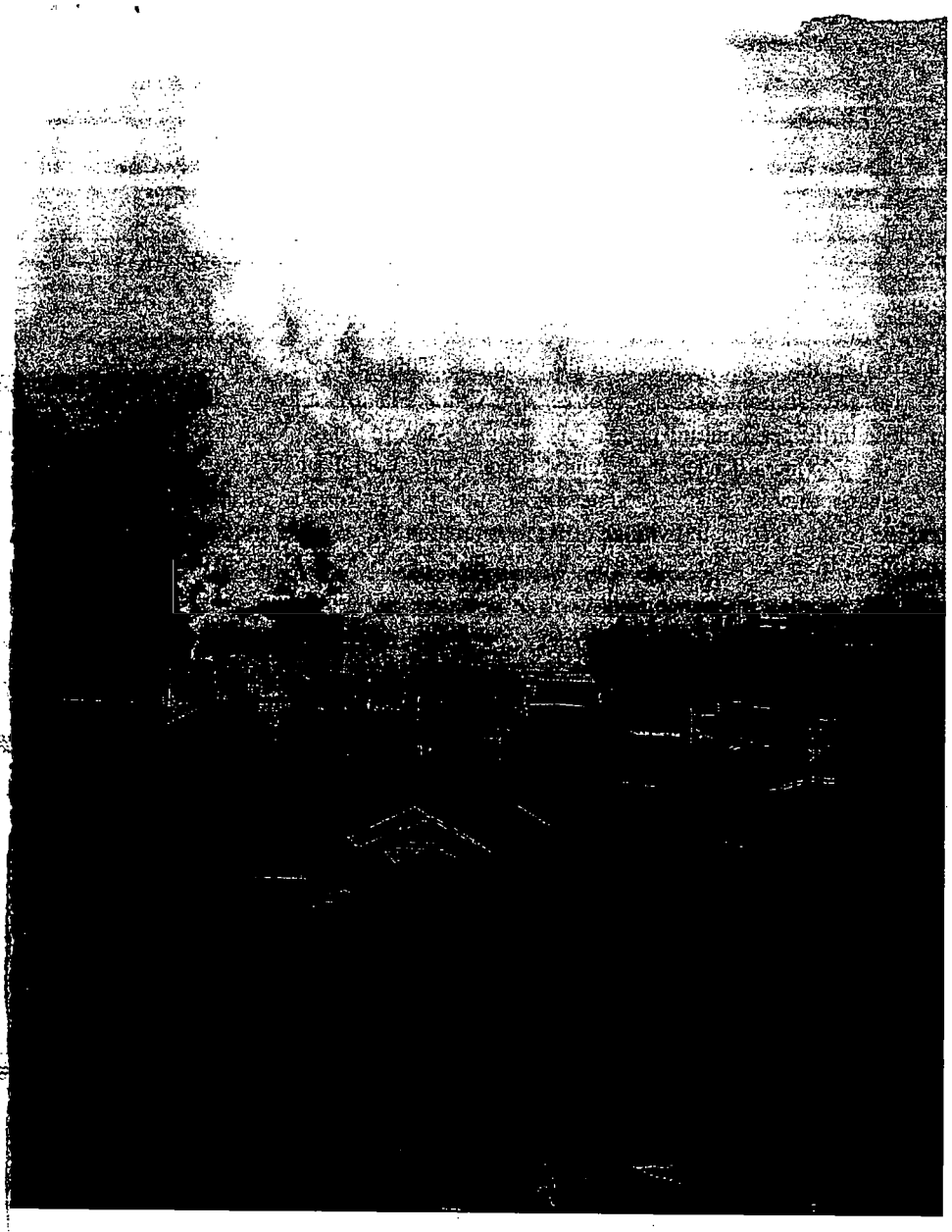
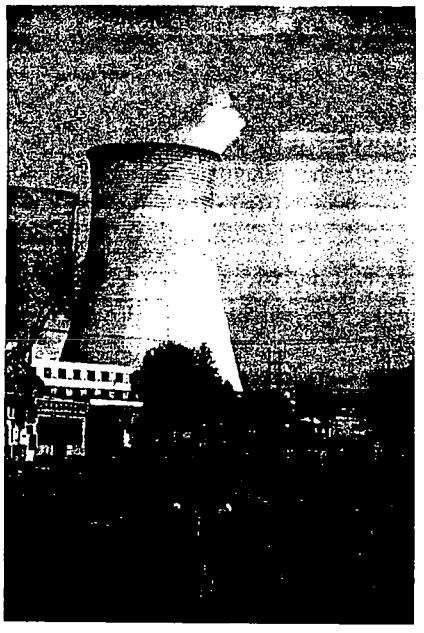




government in this area." Unfortunately, TVEs account for only a fraction of China's pollution—estimates range from five to 30 percent. To make a real dent in the problem, state-owned enterprises like the Chongqing Paper Factory would have to be closed. But fear of social unrest makes that problematic, as it does the recent pledge by Party leaders to end state ownership of 10,000 of China's 13,000 largest industrial enterprises.

Thus China's leaders find themselves in a box. They can, in the name of economic growth, leave the big factories and other environmental hazards essentially undisturbed and hope that the resulting pollution and ecological destruction do not trigger either unmanageable popular protest or long-run economic stagnation. Or they can clamp down, clean up, and face the double short-term risk of a stalled economy and a wrathful proletariat. Not an enviable choice, but for Chinese leaders not a difficult one either. As Chen Qi, the top environmental official in Liaoning, a region of bitter winter cold and 30 percent unemployment, explained to me, "Heavy pollution may kill you in a hundred days, but without enough heat and food you die in three."

The Collapse of the One-Child Policy

THE most pervasive environment-related myth about China is that couples are allowed to have only one child. But in truth the one-child policy has long been "more slogan than reality," in the words of a top Chinese demographer. The Party was forced by popular resistance to back off from the policy—another example of social unrest driving government decisions. Enraged peasants were actually attacking and killing local Party leaders and their families.

When one Party boss in southern China forced a woman to abort in her seventh month of pregnancy, he lived to regret it. The woman and her husband already had a daughter, but like all Chinese peasants, they wanted a son—the only old-age insurance available in China. During the abortion it was discovered that the woman had been carrying two sons—twins. When the father heard this news, Steven W. Mosher reports in *Broken Earth* (1983), he ex-

ploded in a murderous rage and ran through the village to the house of the Party leader. There the father grabbed the leader's two sons, aged eight and ten, and hurled them down the courtyard well. He then leaped in after them, closing the circle of death with suicide.

Such attacks apparently convinced Beijing that the one-child policy posed a threat to Party authority. In 1984, five years after the policy was inaugurated, it was relaxed, though in rural areas only.

Today the one-child family is all but unheard of in rural China, where nearly three out of four Chinese live. In my six weeks of travel, which took me from Liaoning and Hebei provinces in the north through Shanxi and Sichuan in the middle west to Hunan and Guangdong in the south, I talked with scores of peasant families. I was the first foreigner that some of these peasants, especially the children, had ever seen. Every family I met had at least two children; many had three or four, and some had five or more. In a village near the Pearl River I shot baskets with a boy of ten who shyly told me that he was the youngest of seven. It seems that the only Chinese who do adhere to the one-child target are urban dwellers—especially those who work directly for the government and thus can be easily monitored, and penalized through the withholding of salaries, promotions, and the like.

All of which casts strong doubt on official claims regarding China's population: that Chinese women average only two births each; that the population will not reach 1.5 billion until 2030; that it will peak at 1.6 billion in 2046. Although some newly affluent families are, in the familiar demographic pattern, having fewer children, the gross numbers are almost certainly greater. The truth is that no one knows exactly how big China's population is, or how fast it is growing.

"Ten years ago China had a reputation for having the best population statistics in the world, because there was no way for its people to hide what they were doing from the government," Gu Baochang, the associate director of the official China Population Information and Research Center, told me. "But today Chinese figures have become very questionable. The problem is, the local Party leaders compete with one another to post the lowest birth rate, just as they compete to have the highest economic growth rate. . . . So at each level of authority the targets get tightened. If the central government sets a target of eighteen births per thousand people this year, the provincial leaders tell county officials no, they must achieve sixteen, and the county leaders tell village officials no, it must be fourteen." The regrettable results, Gu added, include a renewed coercion of women, continued abortions of female fetuses, and underreporting of the nation's true birth rates up the chain of command.

Yet even scrupulously honest reporting would not change the fundamental fact that Chinese leaders waited too long to attack the problem. In the late 1950s Mao brushed aside warnings about the approaching difficulties, arguing that China could always produce its way out of trouble, since "every mouth is born with two hands attached." Not until 1971, when the population already exceeded 850 million, did China begin pursuing birth control in earnest. The "later, longer, fewer" program urged later marriages, increased spacing between children, and a limit of two children per family. It was both less coercive and more successful than the subsequent one-child policy, reducing average births per woman from 5.8 in 1970 to 2.8 by 1977—a remarkable achievement. But it was not enough. Because the base number—China's population—was already so large, even this lower rate of growth translated into huge absolute increases.

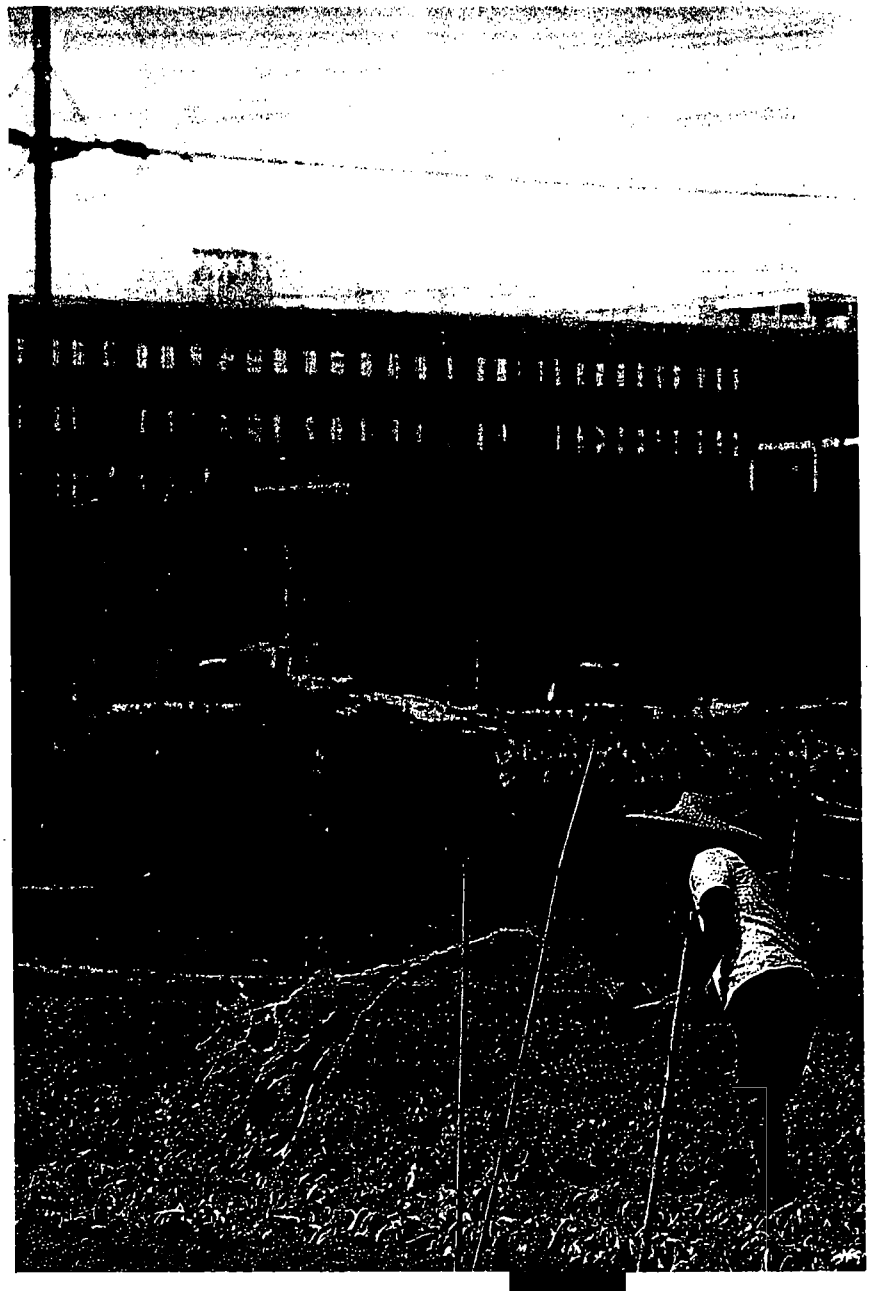
That dynamic still operates today, which may be why President Jiang in 1996 spoke of reanimating the one-child policy. Even if the official Chinese claim of 2.0 births per woman is accurate, that amounts to an annual increase of 15 million people. "So even though China has reduced its fertility as much as possible," Gu explained to me, "the total population is still growing as much as it was in the early 1970s, when women were having four or more children each."

Population growth is probably China's most important environmental issue, because it magnifies all others. For example, China ranks near the very bottom in global comparisons of per capita supplies of arable land, fresh water, and forests. This is in part because so much of China's land is arid, and in part because Mao, in his mad Great Leap Forward, ordered millions of trees to be cut down. But the country's gargantuan population makes a bad situation worse.

Beijing has so little water that Party leaders have questioned whether the city can remain the capital, according to Yu Yuefeng, the staff director of the Environmental Protection and Natural Resources Conservation Committee of the National People's Congress. With a nervous chuckle, Yu told me that the problem has eased in the past two years, thanks to higher than normal rainfall, but, he conceded, "This is a roll of the dice. We have to rely on the gods to keep the rains coming." In his privileged Party position Yu can afford to laugh. The problem is not so amusing for some 50 million people in rural northern China who must walk for miles or wait for days to obtain any drinking water at all. As for farmland, population growth has reduced the supply per person to about the size of one third of a tennis court.

Everywhere I visited, I noticed that China *felt* crowded. How could it not? China's population is five times that of the United States, even though the two countries occupy roughly the same amount of land area. But since deserts and mountains make the western half of China inhospitable to human settlement, 90 percent of its population lives in the east. Imagine, then, almost nine times as many people living east of the Mississippi as live there in real life. That is everyday reality in China.

In all the thousands of miles of scenery I observed during my travels, I cannot recall a single place without signs of intense human settlement. Open space was for farming, period, and was cultivated to within an inch of its life, with furrows reaching right to the edge



Field and factory, Shenzhen

of any road and curling into hollows as small as pitcher's mounds. In daylight hours the cities become churning masses of congestion. Although China has only one car for every 150 inhabitants (the United States has one for every *two*), that still means a huge number of cars. Jockeying for space alongside them are sky-blue cargo trucks, ancient city buses, an occasional horse-drawn wagon, and an endless fleet of bicycles—many of them three-wheeled cargo bikes, transporting everything from bulging sacks of fruit and vegetables to freshly skinned sides of pork to couches, toilets, and televisions.

Traffic jams are the rule. Since no vehicle seems capable of forward motion without frequent beeps of its horn (Chinese drivers say this is necessary to clear the way forward, just as they honestly believe that using headlights at night wastes gas and causes accidents), making one's way across town is a stressful adventure. Negotiating the sidewalks is no better, partly because the pavement is invariably covered with many kinds of litter: plastic bags, peanut shells, cigarette boxes, food cartons, construction-site refuse, and other unsavory items. Pedestrians don't necessarily try to crash into one another, but they certainly don't shrink from it. Intersections are bedlam. There are no STOP signs, very few traffic lights, and no concept of right-of-way, so everyone simply presses forward at all times. Crossing the street often resembles a game of chicken, with pedestrian and driver inching ahead in apparent disregard of each other until someone blinks. In the swarming cacophony of urban China one presses forward or gets run over.

Public transportation in China is not for the claustrophobic, to put it mildly. In trains and buses one's body is constantly pressed against, usually from two or more sides, by the bodies of other passengers, who seem neither to notice nor to care. As they have done with so many discomforts over the years, the Chinese have grown used to such close proximity. Zhenbing and I were once standing in line at a train station, waiting to offer the bribe necessary to gain sleeper tickets, when suddenly I felt myself grabbed from behind and moved aside as roughly as if I were blocking Patrick Ewing's path to the basket. I'm not the fighting type, but I instinctively whirled around to find . . . no one. The culprit, a man in his sixties, had already hurried past me, intent on his destination. There had been no malice in his gesture, only the natural impatience of an animal who has been confined in too small a space with too many others for too long a time. I tried to take a calming deep breath, but my lungs couldn't reach it. Not for the last time in China, I felt as if I had stumbled into some fiendish laboratory experiment that was mushrooming beyond control.

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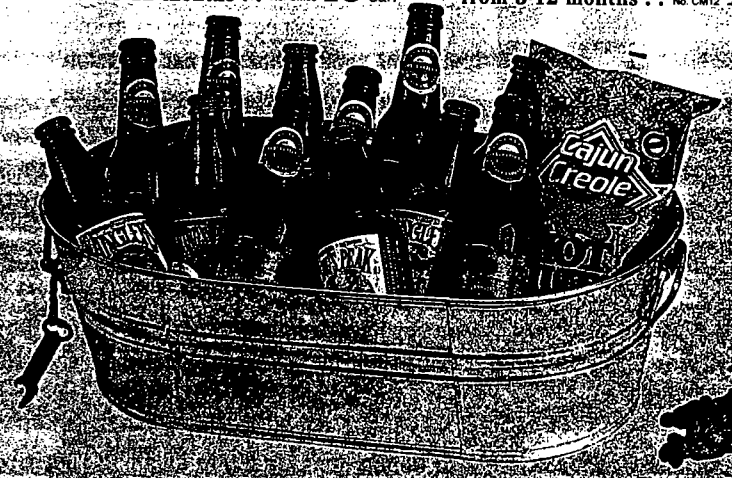

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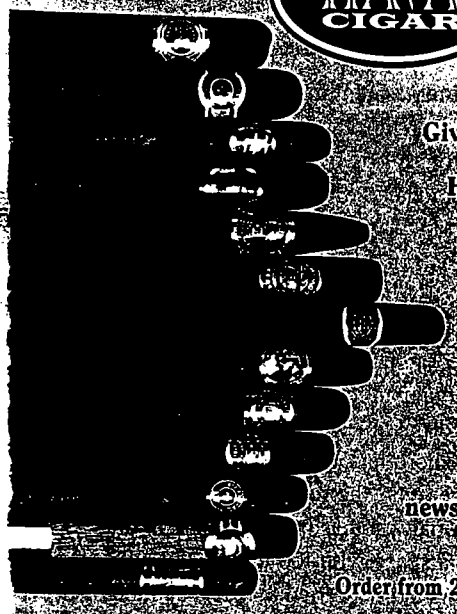

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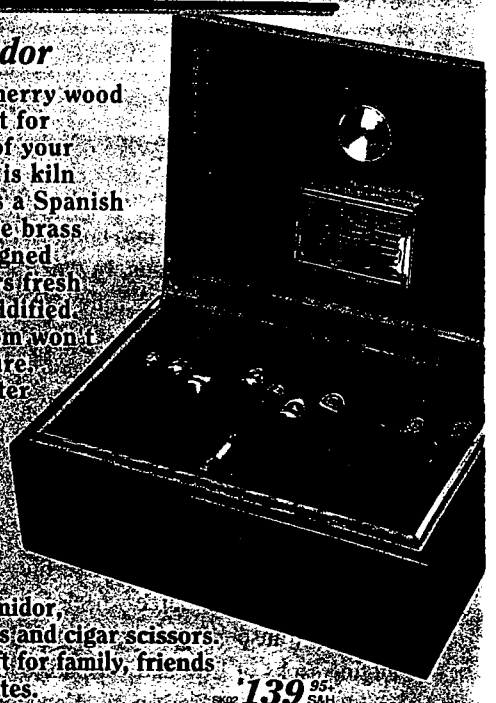

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The Meaning of Spitting

WALKING down the sidewalk in China was a challenge not only because of all the people I had to dodge but also because of the puddles of spit they left in my path. Everyone, it seems, spits in China—on the sidewalk, in the classroom, on the train, in restaurants. The habit is universal. During a daylong train ride from Shenyang I was wedged between a sniffling peasant girl on one side and her older brother or cousin on the other. We had "hard-seat" tickets—the lowest class, and the only ones available. I was a curiosity to these peasants, and to show friendship the young man offered me a few of the sunflower seeds he and his family of seven were munching. Upon finishing his own seeds, he washed them down with a swig of tea and then, with a deep hawking sound, summoned from his throat a prodigious gob of phlegm, which he casually spat onto the floor in front of us. He then reached out his foot and rubbed the spit into the floor, as if stamping out a cigarette. It was 8:15 A.M., there were fourteen more hours to Beijing, and lots more spittle was loosed throughout that packed compartment before we arrived.

The Communists tried to eradicate spitting when they came to power, in 1949; it was one of their first exhortations to the masses. They failed. Spitting lives on because it is a habit of peasant life, and the vast majority of Chinese are still peasants or only one generation removed. The habit apparently derives from the basic conditions of peasant life, which include rampant lung infections and other respiratory problems. These, in turn, result from a historical fact with enormous environmental implications: for centuries Chinese peasants lived with very little heat in wintertime. They burned wood if they were lucky, but more often they used dried leaves and crop stalks, as Zhenbing remembers his family doing exclusively before he turned ten, in 1976. Today peasants still rely on such "biomass" fuels for 70 percent of their energy consumption.

Coal therefore represents a great advance for the Chinese people; it keeps a body much warmer. But it does so at terrible cost: the Chinese are dying in frightful numbers from coal smoke. Twenty-six percent of all deaths in China are caused by respiratory disease. Coal smoke is not the sole cause of these deaths, but it is a major contributor. Outdoor air pollution, of which coal smoke is the main component, is second only to cigarette smoking as a cause of lung cancer in China's cities, where lung cancers have increased 18.5 percent since 1988. Coal is also a central element in the "indoor pollution" from home stoves that is the chief cause of rural lung cancers, especially among women.

There is little hope of relief. One of the few natural resources China has in abundance, coal accounts for three quarters of total energy consumption. The country's power stations and manufacturing plants are fueled overwhelmingly by coal. Factor in coal's dominant role in keeping people warm, along with the primitive technologies often employed, and it's no surprise that Chinese cities, especially in the industrial, frigid north, have some of the filthiest air on the planet.

Levels of "total suspended particulates," or TSP (soot and dust, in lay terms), are appallingly high in China—often four to nine times as high as the World Health Organization's guideline of 60 to 90 micrograms per cubic meter annually. Most American cities have readings in the 40-to-60 range; New York measures 62. In some northern cities in China the level climbs as high as 400, 500, or even 800 in wintertime.

The Ghosts in Tiananmen Square

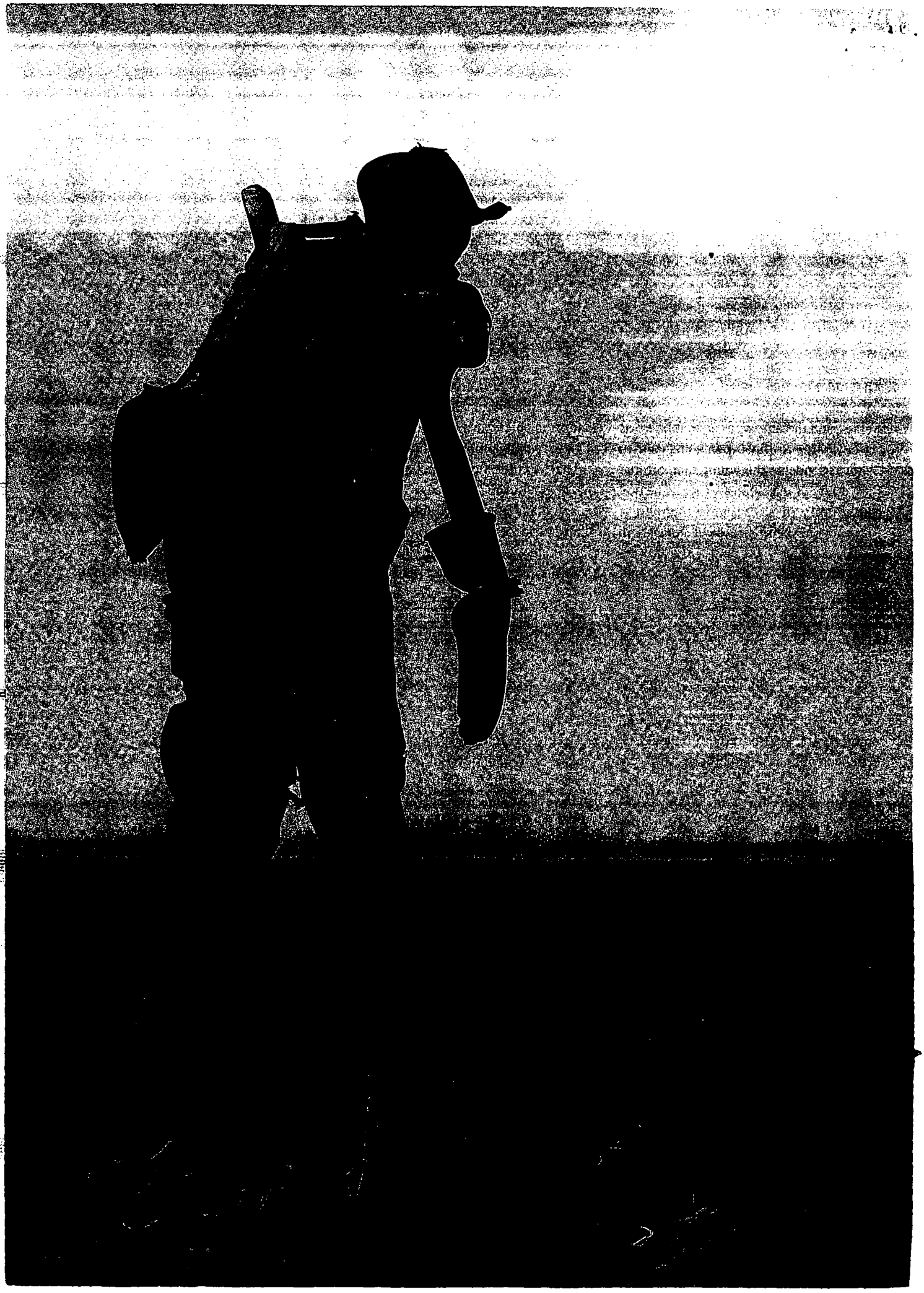
VISITORS to Beijing can forget seeing blue skies in winter, except immediately after Siberian winds have roared through. By chance such winds struck the capital the night of my arrival. But two days later the winds calmed, and over the following week and a half I witnessed the sickening descent of the city into murk and gloom.

At noon on my third day, a Saturday, after barely twelve hours of still air, I took a bus across town to a luncheon interview, traveling the main east-west boulevard past Tiananmen Square. Directly above me the sky was still blue, but in the distance a fuzzy pale-gray layer of smog already frosted the skyline. When I came back outside a mere four hours later, the layer had nearly doubled in thickness, its blurry density giving the sky an otherworldly aspect as it melted into a sunset of vivid pinks and yellows. The pollution accumulated with each passing day, and by Thursday I was used to waking up to a dull gray-white haze that rested on the city skyline like a lid on a wok.

On Friday morning I took a taxi to the National People's Congress. Passing through the larger intersections of Beijing, I looked both ways down the cross streets, but my line of sight extended no farther than about 200 yards. When I reached Tiananmen Square, at 8:45, the sun hung white and barely visible above the southern gate to the Imperial Palace, like a dim light bulb in a barroom full of cigarette smoke. Gazing north, past Mao's mausoleum and the site of the 1989 massacre, I could not see the far end of the square, much less the Forbidden City beyond it. The pedestrians crossing the square were like spectral figures, half ghost, half flesh, as they disappeared into the gritty mist.

During our travels beyond Beijing, Zhenbing and I fell into a running debate over which city in China had the nastiest air. Was it, in fact, Beijing? Zhenbing, a resident of the capital, wouldn't entertain the possibility. Was it Benxi, in Manchuria, whose pollution was so thick that in the 1980s the city had vanished from satellite photos? Possibly. Though Benxi was now visible again from outer space, local officials admitted that its TSP levels remained very high. What's more, my interviews with residents suggested that what progress had been made stemmed as much from widespread factory bankruptcies as from the government's vaunted cleanup campaign.

For a day I leaned toward Datong, an



ugly, low-slung town known as China's coal-mining capital. Bad as the air was in Beijing, it was unusual there to see smokestacks belching copious amounts of pure-black smoke; the pollution somehow seemed more dispersed. In Datong black emissions were routine and ubiquitous. Nevertheless, Datong was soon supplanted by Taiyuan, its neighbor to the south. Taiyuan, the provincial capital, was another major coal center that seemed to impose no controls on smokestack emissions. But it had a population of four million, nearly five times that of Datong. Its air was as soupy and gray as a foggy day in London, though there was no natural fog within a hundred miles.

Another formidable competitor was Xi'an, the ancient imperial capital known the world over for the enormous collection of terra-cotta warriors buried outside town. A splendid bell tower and massive city wall dating back to the Ming dynasty further enhance Xi'an's reputation as one of China's loveliest cities. But Xi'an's pollution screened these architectural treasures from view. Even on a sunny day the only sign of the orb itself was a patch of sky somewhat brighter than the rest. As a test I timed how long I could stare at that artificially veiled sun without hurting my eyes. After sixty seconds I stopped counting.

Astonishingly, the Chinese I met insisted that their health is not endangered by all this pollution. I developed a dry, rasping cough because I was a foreigner; they, on the other hand, were "used to it." I heard that phrase dozens of times, even from people who should have known better. One leading environmental scholar and advocate in Beijing, for example, assured me that his lungs could tolerate his daily jogs because he had been breathing Beijing's air for years. By that logic, of course, smoking cigarettes poses no health risk so long as one begins in early childhood. He granted the point, but said that since he could not escape Beijing's air, he at least wanted to be as strong and fit as possible.

The biology of cancer seems to be unknown to many Chinese; even well-educated people appear to be unaware that the human body cannot build up tolerance against industrial carcinogens the way it can against the infections that cause influenza. But the lack of awareness goes deeper. "A tendency to deny unpleasant realities has become part of the Chinese personality in recent decades," according to Orville Schell, the author of many books on China. "A society that has for decades had to ignore so many unjust and irrational things in order to just get along—the injustices of the gulag, families ruined during the Cultural Revolution, other kinds of government barbarity, the lack of a believable news media—is one in which the capacity to avoid recognizing all sorts of problems, including environmental ones, has become essential to survive," Schell says. In addition, most Chinese accept the familiar idea that economic growth requires environmental damage, and they are quite ready to pay that price. "We have a saying in China," one journalist who has tried to raise public awareness of the subject told me. "'Is your stomach too full?' In other words, are you so well off you can afford to complain about nothing? This phrase is used for Americans who talk about saving birds and monkeys while there are still many Chinese people who don't have enough food to eat."

400 Green Chinese

THE environmental movement in China, such as it is, thus faces a daunting challenge. The few individuals who dare to work on the issue say that by necessity education is the top priority. Liang Conjie, the founder and president of Friends of Nature, one of the very few independent environmental groups in China, told me that his organization got permission to operate because it registered as a cultural rather than a political group. He added that with a mere 400 members, "Friends of Nature could never oppose the government directly, the way Greenpeace would—that will not work." Liang focuses instead on raising public consciousness, particularly by prodding Chinese journalists to cover environmental issues more attentively.

It would be hard to overstate the power that the government-run media exercise in China, so, not surprisingly, Liang was glad to see an increase during the past year in media criticism of environmental problems. Much of that increase has been orchestrated by the government itself, specifically the National Environmental Protection Agency. But there are definite limits to what the official media will say. "In my stories," one journalist told me, "I always have to begin with something positive—how NEPA has announced new policies to protect the air, for example—not with how the pollution got there in the first place and what its exact effects are. So people don't know how bad the situation actually is."

Is it cynical to observe that the Chinese media's newfound interest in environmental issues correlates rather neatly with the environmental crackdown on TVEs that Beijing ordered last summer? The coverage will probably continue as long as the Party keeps pressing the environmental issue, but how long will that be? "The anti-pollution campaign may soon blow over," says Jasper Becker, of the *South China Morning Post*. "The pattern is for such campaigns to come and go, each being replaced by another, and then everyone goes back to doing what they were doing before."

Whose Camel Is It?

PRESIDENT Bill Clinton has said that in his meeting with President Jiang Zemin, in October of 1995, he told Jiang that the biggest security threat China posed to the United States was related not to nuclear weapons or trade agreements but to the environment. Specifically, Clinton worried that China would copy America's bad example while pursuing economic development and end up causing terrible air pollution and global warming. Clinton said he could tell that Jiang "hadn't thought about it just like that." No doubt. Jiang was probably

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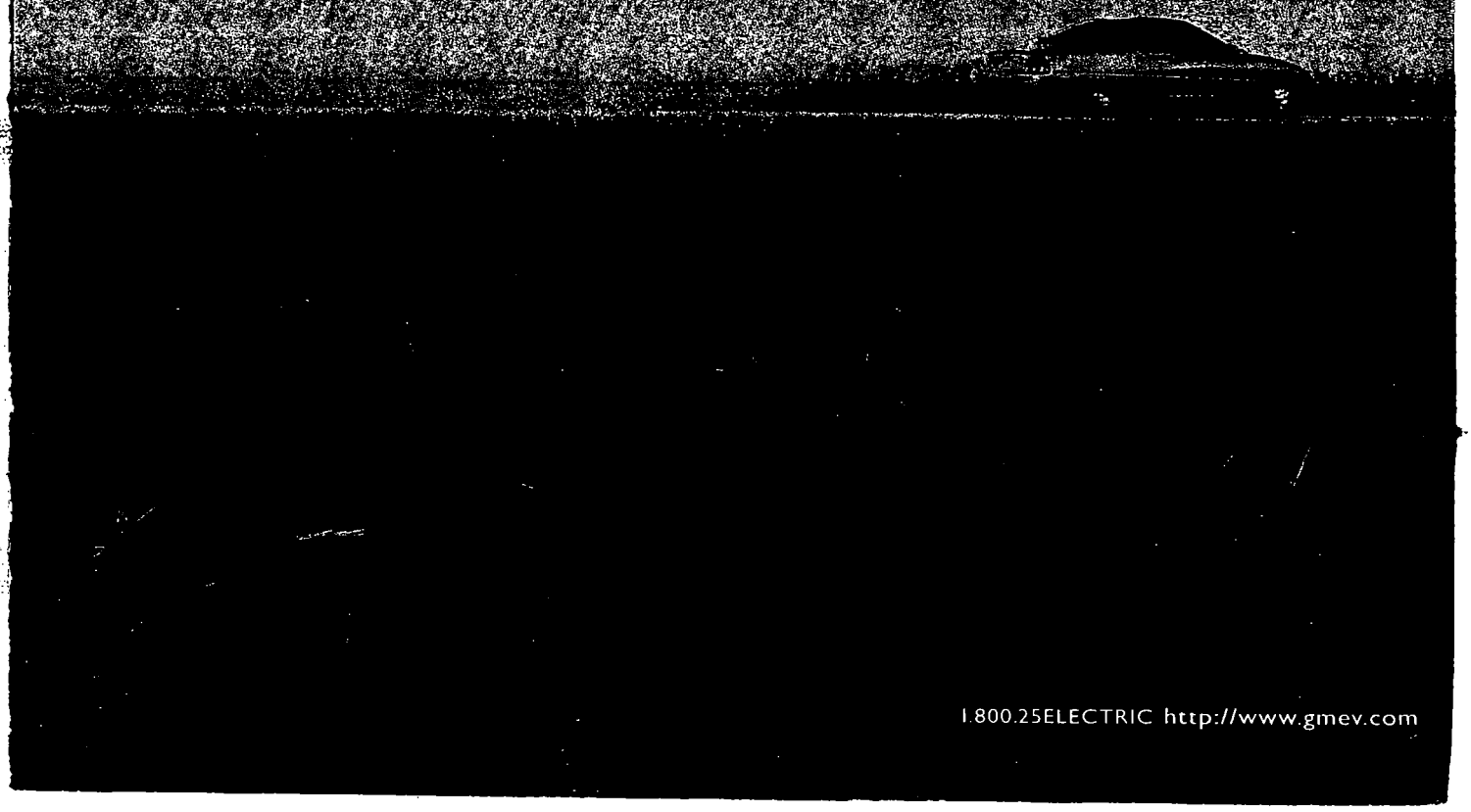

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wondering whether his American counterpart could possibly be serious. If ever there was a non-issue for China's leaders, global warming is it.

"Global warming is not on our agenda," a senior official for the Chongqing Environmental Protection Bureau said with a dismissive wave of his hand when I asked about his agency's strategies to reduce emissions of carbon dioxide and other greenhouse gases. As if to underscore his contempt for the issue, the official asserted something he had to know was false—"All the pollution produced in Chongqing is landing here in Chongqing, so it's not a global problem"—before declaring, "We can't start worrying about carbon dioxide until we solve the sulfur dioxide problem." The official was referring to acid rain, which he and his colleagues in China consider more urgent, because acid rain is landing on them and causing tangible damage *today*, whereas carbon-dioxide emissions threaten merely potential, far-off, worldwide damage.

Shortsighted? Yes, but understandable. I arrived in China eager to investigate the issue of climate change, but I almost forgot to raise the point during some interviews. When one is inhaling appallingly polluted air for weeks on end, one tends to focus the questions on that.

China is a greenhouse giant. It has already surpassed the former Soviet Union to become the world's second largest producer of greenhouse gases, trailing only the United States. With its immense coal reserves, huge population, and booming economic growth, China is very likely to triple its greenhouse emissions by 2020. Absent a radical shift in policies elsewhere in the world, that increase will accelerate global climate change, plunging the world into potentially catastrophic territory—melting polar ice caps, raising sea levels, causing more and nastier hurricanes, droughts, and blizzards. China will by no means be immune. Much of its coastline could face severe flooding; perhaps 67 million people could be affected.

Yet China has little patience with Western finger-pointing on the climate-change issue, regarding it as a cynical means of constraining China's economic development. That is oversensitive, but it contains a kernel of truth. For all its nuclear weapons, grand ambitions, and mobile-phone-wielding, expensively dressed business executives, China remains a poor country where hundreds of millions of people have no reliable supply of electricity. What's more, China emits a far smaller amount of greenhouse gases per capita than the rich nations whose earlier industrialization has already condemned the world to climate change. If outsiders want China to do something about global warming, they will have to pay for it. As one Western consultant with regular access to senior Chinese officials puts it, "They know very well they can hold the world for ransom . . . and whenever they can extract concessions, they will."

"The Americans say China is the straw that breaks the camel's back on greenhouse-gas emissions," says Zhou Dadi, the deputy director general of the State Planning Commission's Energy Research Institute. "But we say, 'Why don't you take some of your heavy load off the camel first?' If the camel belongs to America, fine, we'll walk. But the camel does not belong to America. China will insist on the per capita principle [of distributing emissions rights]. What else are we supposed to do? Go back to no heat in winter? Impossible.

"China is not like Africa, you know—some remote place that's never been developed. We used to be the most developed country in the world. Now, after many decades of turbulence, civil war, revolution, political instability, and other difficulties, we finally have the chance to develop the country again. And we will not lose that chance."

A Terrible Dilemma

To get rich is glorious, in Deng Xiaoping's famous phrase. Although unrestrained growth can destroy the ecosystems on which all economies ultimately depend, the headlong pursuit of wealth is the cornerstone of modern Chinese life. The crowning irony is that even China's top environmental officials accept that economic growth must take precedence over environmental protection for years to come. Economic growth is essential not only to maintaining political stability—avoiding a return to the chaos and stagnation seen during the Cultural Revolution—but also to financing the environmental cleanup. "The money will come from the polluter-pays principle," explains Zhang Kunmin, another deputy administrator of the National Environmental Protection Agency. "The enterprises and households must pay the true costs of a cleaner environment, so they need more wealth."

"This is the terrible dilemma of China's environmental crisis," argues a Chinese environmental expert who must remain nameless. "If economic growth stops, people will go back to the old, dirty, cheaper methods of production. Worse, there will be political instability, and that will overshadow everything; in that case no one will have time to worry about the environment. Of course, this rapid economic growth will cause additional environmental damage; some things in the environment are irreversible. That's why I think China will have to lose something—some species, some wetlands, something. We are working very hard to strengthen our environment. But, much as I regret it, you cannot save all the things you would like. You cannot stop a billion people."

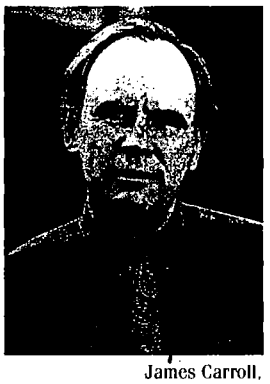
It is true: China, and the rest of us, will have to "lose something" in the years ahead. But the scope of that loss matters greatly, and can be influenced. China has made great strides in the past toward the efficient use of energy. With (self-interested) help from the United States and other wealthy nations, a program to install efficient equipment and processes throughout China's energy system could reduce its energy consumption by half. Similar improvements are possible in other areas of environmental policy. But there is no time for delay or half measures. As a government scientist in Chongqing told me, "It is never too late to learn, but it is very late."

Atlantic Unbound Interviews

Where conversation is not a dying art.

Garrison Keillor,
Wobegon Boy

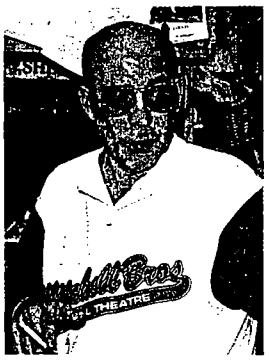
Robert Pinsky,
The Inferno of Dante



James Carroll,
An American Requiem

Cynthia Ozick,
The Puttermesser Papers

Jane Hirshfield,
The Lives of the Heart



Hunter S. Thompson,
The Proud Highway

Barbara Dafoe Whitehead,
The Divorce Culture

Paul Theroux,
Kowloon Tong

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SCENESETTER FOR CHINA: CLIMATE CHANGE

BACKGROUND

U.S. - Sino relations, never without frictions, are nonetheless in a potentially propitious stage where we could begin to form a more strategic partnership in a number of areas. The purpose of your engagement with key Chinese officials on the economics of Climate Change is to promote a better understanding of how the flexibility mechanisms (e.g., the Clean Development Mechanism and international emissions trading) can reinforce China's macroeconomic growth plans while meeting the broader goal of mitigating the threat of Climate Change.

The U.S. and China are the world's two largest greenhouse gas emitters -- and China is projected to surpass the U.S. early in the next century. Clearly, China needs to play a leadership role among developing countries in adopting a "clean growth" strategy, if we are to be successful in addressing this problem. Given China's size and long-term growth prospects, it is in U.S. interests to encourage a reassessment of China's obstructionist position in the Climate Change negotiations, by highlighting the potential for closer U.S.-Chinese cooperation on Climate Change with a view toward building a partnership that improves China's understanding of how a market-based regulatory system can help them achieve both environmental and developmental goals.

With the key leaders you meet you need to underscore the needs for partnership, our joint responsibility to act, and our interest in discussing various approaches (investment through the Clean Development Mechanism and international emissions trading) with them.

To set the tone you might want to reinforce these "partnering" ideas with some of these thoughts.

- China and the U.S. are working together on a number of international issues, such as most recently in the economic and nuclear proliferation problems in South Asia. The Secretary of State, in her recent visit to China, underscored that we should find ways of cooperating more closely on a range of international issues, including long-term challenges like Climate Change.

- Given our unique positions in terms of national greenhouse gas emissions, U.S.-Chinese cooperation makes sense. A better understanding of how flexibility mechanisms can work to promote clean growth in China and ensure we achieve the environmental goals of Kyoto is our objective.

- We have begun a dialogue on environmental issues in the context of the Envionment and Development Forum. Following on the discusions held

during Secretary Albright's recent visit to China, we believe we should broaden these exchanges and exploure how to cooerate more effectively on problems such as Climate Change.

- My role in the U.S. government is to ensure we understand the economic implications of policy decisions. No government, not China, not the U.S., can undertake policies that stop growth -- even for environmental objectives.

- In fact, we have been working hard in the U.S. to "grow the economy, and protect the environment". We believe our growing understanding of "regulatory markets" (market-based regulatory systems) can be as importatnt as U.S. technology in helping achieve both growth and environmental objectives.

- I would like to share some of our thinking with you and begin an exploration of how China can benefit from the Clean Development Mechanism and ultimately a global emissions market.

Background on the U.S. EPA-China Environmental Cooperation

The Governments of the United States of America and the People's Republic of China signed an Agreement on Cooperation in Science and Technology on January 31, 1979, in which the two countries agreed to work together to promote scientific and technical cooperation.

Under the umbrella of this broad S&T Agreement, separate protocols have been signed in a variety of fields between individual agencies of the U.S. Government and their counterparts in the People's Republic of China. The U.S. EPA and China's State Environmental Protection Administration (SEPA) manage one of these — the Protocol between the Environmental Protection Agency of the United States of America and the People's Republic of China for Scientific and Technical Cooperation in the Field of Environmental Protection. This Protocol was signed on February 5, 1980.

EPA also manages a number of efforts outside of the Protocol's framework, often in conjunction with non-governmental organizations, national laboratories, and the private sector. EPA plays an active role in Administration China initiatives including the US-China Forum on Environment and Development, co-chaired by Vice President Gore, and the US-China Energy and Environment Cooperation Inititiative.

The following sections summarize ongoing and planned cooperation areas:

CLIMATE-RELATED ACTIVITIES:

Climate Change Joint Research/Policy Program

International Co-Control Analysis - As part of a multi-country effort this project will bring US and Chinese researchers together to analyze the environmental benefits of measures that will contribute to reductions in greenhouse gas emissions. On the US side the work will be carried out primarily by WRI. (See attached 1-pager) - OP lead. FY 98 (not yet funded).

National Economic Modeling of Climate Change - In cooperation with the President's Council of Economic Advisors this joint effort with Chinese experts will develop improved capacity for analysis of costs and economic impacts of policies to limit increases in greenhouse gas emissions and carry out analysis of flexibility mechanisms. Partners on US side include Harvard University and Pacific Northwest National Laboratory. (See attached 1-pager) - OP lead. FY 98 (not yet funded).

Technology Cooperation Agreements Pilot Project (TCAPP) - TCAPP is a voluntary partnership to advance implementation of clean energy technologies. USAID funds the program in five countries while EPA funds the China program. Implemented by the National Renewable Energy Laboratory with in-country partners, the program assists country teams in developing and implementing climate technology plans and in engaging private sector and donor organizations. (See attached 1-pager) - OP lead. FY 98.

Atmospheric Pollution Prevention Projects

Coalbed Methane Recovery and Use - This EPA effort began in 1990 and has been implemented jointly with a $10 million GEF-funded effort which has just been completed. EPA will participate on the evaluation panel. Technical cooperation in demonstrating advanced methane recovery technologies at three sites in China; and establishment, technical support, and staff training for a Coalbed Methane Clearinghouse at the China Ministry of Coal. International Coalbed Methane Conference held in October 1995. The Clearinghouse and EPA prepared a joint report (in English and Chinese) entitled "Reducing Methane Emissions from Coal Mines in China: The Potential for Coalbed Methane Development" (1996). EPA is also providing technical cooperation to an APEC coalbed methane scoping effort in China which is moving to the design phase for enhances recovery and town gas use. EPA represents the US on the APC 4-nation advisory panel. A coalbed methane investment workshop is planned for November 9-11 in China and will be followed by a technical workshop co-hosted by EPA and the State coal Industry Bureau. Partners include United Nations Development Program - Global Environmental Facility, China Ministry of Coal Industry, China United Coalbed Methane Corporation, LTD, and the APEC Experts' Group on Clean Fossil Energy. Office of Air and Radiation / Atmospheric Pollution Prevention Division lead.

Energy Efficient and CFC-free Refrigerators - Technical cooperation with Chinese regulators and factory managers in converting refrigerator factories to produce models which use 50% less energy and are non-ozone-depleting. Design and testing of domestic Chinese refrigerators. Analysis of China's market transformation of refrigerator industry, including refrigerator design and evaluation; testing, manufacturing, and marketing. Partners include China National Council of Light Industry, Beijing Household Electrical Appliance Research Institute, China State Environmental Protection Administration, Montreal Protocol Fund and Global Environmental Facility, Germany's GTZ, University of Maryland, Lawrence Berkeley National Laboratory. Office of Air and Radiation/APPD lead.

Technical Assistance for energy-efficient lighting in China - Provide training at China's State Bureau of Technical Supervision and the Beijing Energy Efficiency Center in the development of standards for energy-efficient lighting in China, and in test procedures to improve production in China of energy-efficient fluorescent lamps. Carried out by Lawrence Berkeley National Laboratory with the China State Bureau of Technical Supervision and the Beijing Energy Efficiency Center, and State Economic and Trade Commission. OAR/APPD lead.

Technical Assistance to improve energy efficiency of air conditioners in China - This project will assess and assist market transformation efforts to attain market dominance for energy efficient air conditioners. Specific efforts in China include monitoring air conditioner energy use and operating patterns, development of efficiency standards, and addressing technical and market barriers to air conditioner efficiency improvements. Carried out by American Council for an Energy Efficient Economy, Lawrence Berkeley National Laboratory, Beijing Energy Conservation Center, and State Economic and Trade Commission. OAR/APPD lead.

Halon Phaseout Program - Training of Chinese fire protection experts in operation of Halon 1211 recovery/recharge machines, and fire-extinguisher maintenance practices to prevent

unnecessary Halon emissions. Three workshops held in 1993 with 128 experts trained and 23 machines delivered for operation in various cities and provinces throughout China. Initial assessments completed of Halon use in major manufacturing sectors. Parners are U.S. Navy,Chinese Ministry of Public Security, United Nations Development Program / Global Environmental Facility, Montreal Protocol Fund, China State Environmental Protection Administration. Office of Air and Radiation/Stratospheric Protection Division lead.

Environmental Technology Intiative (USTIES) Climate-related Projects:

Pollution Prevention in the Petrochemical, Pharmaceutical, and Metal Finishing Industries of China - Technical cooperation with China on pollution prevention technologies and practices through workshops, assessments, and technology demonstrations. Completed
Partners include State of Illinois, US Environmental Protection Agency - Office of Research and Development, World Bank, United Nations Environment Program

U.S. - China Energy and Environment Technology Center - Technical cooperation with China to disseminate information on energy and environmental technology related to electric power. Information exchange, demonstrations, and research on energy and environmental technologies such as clean coal, oil and gas. Partners are EPA - Office of International Activities U.S. Department of Energy, Tulane University, China's State Science and Technology Commission.

Integrated Gasification Combined Cycle (IGCC) Power Generation To Achieve Emissions Reduction - Technical cooperation with China to construct an IGCC demonstration power plant which uses 1/3 less water and produces less CO2 and toxic emissions than other coal burning technologies. Cost efficiency studies, research and identification of manufacturing capabilities in China, and workshops and training on IGCC technology and benefits. Partners are U.S. Department of Energy, Texaco Corporation. OIA lead.

Energy Efficient Buildings Project - Hong Kong - Demonstration in government office building of measures to make buildings more energy-efficient. Partners are U.S. Department of Commerce, US-Asia Environmental Partnership, Hong Kong Polytechnic University, Hong Kong EMSD, The Negawatts Company. OIA lead.

Asia Pacific Initiative for Renewable Energy and Energy Efficiency - Technical cooperation with China to increase the acceptance and understanding of renewable energy technologies in Asia through training workshops, development of model regulations, and technology demonstrations. Partners are U.S. Department of Energy, U.S. Export Council for Renewable Energy, International Institute for Energy Conservation, APEC. OIA lead. EPA involvement completed.

Wind Energy Mapping - Technical cooperation with China to compile information on wind resources in the People's Republic of China, expected to facilitate greater U.S. private sector involvement in wind energy projects in China. U.S. Department of Energy, National Renewable Energy Laboratory.

OTHER ACTIVITIES

Pollution Prevention and Environmental Education - The Air and Waste Management Association is working with China's Tianjin City and Anhui Province to improve capacity of pollution prevention centers. AWMA is also working with China's Global Village Institute to develop and implement environmental education programs. Partners are Air and Waste Management Association, China State Environmental Protection Administration, Tianjin and Anhui Environmental Protection Bureaus, China Global Village, Beijing. OIA lead.

Mobile Sources Emissions Control/Leaded Gasoline Phaseout - A conference/workshop in Beijing, held in October 1995, provided recommendations to the Chinese government on fuels, leaded gasoline phaseout, emissions controls, and transportation planning. Technical recommendations were incorporated into the Ninth Five-Year Plan and in related statutes under consideration in China's legal system. EPA's cooperation was instrumental in China's adoption of legislation calling for the phaseout of lead in gasoline. In follow-up, a NEPA official spent three months at EPA. EPA continues to work closely with NEPA and other organizations on implementing regulations, and organizing training workshops, held in Shanghai and Xiamen in March 1997, on mobile sources air pollution control and lead phaseout, including the development of technical and educational materials for officials and the public. EPA - Office of International Activities, China State Environmental Protection Administration. OIA lead.

Technical Support for China's Nationwide Air Quality Monitoring Network - EPA will provide support in Phase I (eleven cities) of the development of an integrated nationwide air quality monitoring network, and EPA intends to cooperate on Phase II which will extend the network to 47 cities. National and local level officials will receive training through the State of California and at RTP, and US experts will provide on-the-ground advice in siting and calibrating equipment, data collection and analysis, forecasting. Project will assist China in tracking and controlling pollution sources and in raising public awareness. Partners are U.S. Department of Commerce, California Air Resources Board, National Association of State Development Agencies, China State Environmental Protection Administration. OIA lead. FY98.

Sectoral Energy Efficiency Studies - Technical cooperation to assess alternative energy utilization scenarios for particular sectors which are considered major contributors to greenhouse gas emissions. The final outcome will be a detailed roadmap of technologies, environmental benefits, and costs for individual sectors. Carried out by Lawrence Berkely National Laboratory. OIA lead.

Children's Lung Function Study - An epidemiological study of the effects of air pollution on children's lung function in four Chinese cites: Wuhan, Chongqing, Guangzhou, and Langzhou. The project has generated data useful in U.S. for setting of air quality standards, especially for particles (fine and PM10). EPA - Office of Research and Development / National Center for Environmental Assessment (NCEA-RTP) through agreement with Robert Woods Johnson School of Medicine, China State Environmental Protection Administration - Chinese National

Environmental Monitoring Center. ORD lead.

Technology Seed Grant to National Assoc. Of State Development Agencies - Technical cooperation with China to transfer U.S. environmental technologies to areas of critical need in China. NASDA provides assistance to U.S. state development agencies which fund demonstrations of U.S. environmental technologies in China. Among the technologies are: Venturi Scrubber Technology for Fine Particulate Control; CAF System Industrial Wastewater Treatement; Bioremediation Wastewater Treatment for Capital Steel; Wastewater and Energy Improvements for Juxian Pulp & Paper Mill; Mobile Industrial Wastewater Treatment Demonstration Unit; Electric Bicycle Design Modification and Demonstration, Air Quality Monitoring. Managed by National Association of State Development Agencies (NASDA). OIA lead.

Pollution Prevention and Control in China's Huaihe and Haihe River Basins - Technical cooperation with China to utilize U.S. environmental pollution prevention and control technology and management approaches in solving a severe water pollution problem in watersheds which have been identified as a priorities at the top levels of the Chinese government. Partners include the Maryland-China Business Council, U.S. Environmental Training Institute, Air and Waste Management Association, China's Anhui Province Environmental Protection Bureau, National Association of State Development Agencies, The World Bank. OIA lead.

Genetic Susceptibility to the effects of aromatic solvents on reproductive health - Technical cooperation in evaluating the effects of aromatic solvent exposure on the reproductive health of workers at a Chinese petrochemical complex. Carried out by Harvard University School of Public Health and Beijing Medical University, and Yanshan Petrochemical Refinery, Beijijng. ORD lead.

Epidemiological and Biomarker Study of Health Effects of Arsenic Exposure - To conduct research on serious endemic arsenic exposure in Inner Mongolia. ORD lead.

Chemical Transformation Processes - Metal Interactions at Organic Matter Surfaces - Technical cooperation in the development of models to predict distribution of heavy metals on organic matter surfaces and in pore water, and to predict metal speciation in both phases. Research results have been presented at several scientific conferences. EPA - Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Academy of Environmental Sciences. ORD lead.

Chemical Transformation Processes - Metal Interactions at Mineral Surfaces - Technical cooperation in geochemical research. Research results presented at two conferences; five journal articles and one book chapter published. Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Center for Eco-Environmental Sciences. ORD lead.

Modeling Chemical Transformation Processes and Metals Pollution in China's Poyang Lake - Technical cooperation in investigations of the dynamics of pollutant transport and

biogeochemistry. Modeling of geochemical processes in freshwater sediments. Office of Research and Development / National Exposure Research Lab (NERL - Athens), Chinese Research Center for Eco-Environmental Sciences. ORD lead.

Water Quality Study of China's Zhejiang Harbor - Technical cooperation in development of water quality models for tide gates; and simulation of waste load reduction effects on water quality. Development of management tools to achieve water quality goals in an important Chinese seaport and historic tourist area negatively impacted by navigation and industry. EPA - Office of Research and Development / National Exposure Research Laboratory (NERL - Athens), China's Nanjing Institute of Environmental Sciences. ORD lead.

Effects of Global Climate Change on Large Lake Systems - Technical cooperation as part of a global project: "Factors Influencing Terrestrial Organic Matter and Trace Gas Dynamics in Temperate Forest, Wetland, and Agricultural Soils." Field and laboratory studies of organic matter transformations, ecosystem productivity, and effects of climate variations on organic matter cycling. Office of Research and Development / National Exposure Research Laboratory (NERL - Athens), China's Xinjiang Province Institute of Environmental Protection. ORD lead.

Joint Biomonitoring of Toxic Discharges, Nanjing River - Technical cooperation with Chinese regulatory agencies in evaluation of toxicity of aquatic discharges. Development of toxicity identification techniques with benefit to U.S. regulators in implementing effluent toxicity limits. Office of Research and Development / National Health and Environmental Effects Research Laboratory (NHEERL - Duluth), China National Environmental Protection Agency, China's Nanjing City Environmental Protection Bureau, Nanjing University, University of Minnesota-Duluth. ORD lead.

Other USTIES Projects

Hazardous Waste and Toxics Disposal - Technical cooperation to strengthen China's toxic waste regulations, provide demonstration facilities and sample technical specifications for hazardous waste treatment, and evaluate hazardous waste treatment technologies for China. Partners include New York State Department of Environmental Conservation, China National Environmental Protection Agency, World Bank, Asian Development Bank. OIA lead.

Demonstration of Combined NOx/SOx Control Technology - Field demonstrations of a low-cost NOx and SOx removal technology. Carried out by Southern Research Institute. ORD lead.

Membrane Drinking Water Treatment - Technical cooperation with China to demonstrate cost-effective technologies for the control of toxic chemicals and pathogenic microorganisms in drinking water in China. Partners include U.S. Department of Agriculture, Shandong Province Water Resources Management Office, Zibo City, Shandong Province, China Ministry of Geology and Mineral Resources, China Institute of Hydrology. ORD lead.