

Ancient Scientific and Technological Heritage of India

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What are the Current Problems Faced by Humankind?

- Depletion of Natural Resources
- Extinction of Species
- Global Warming
- Climate Change
- Environmental Pollution
- Pollution of Human Mind
- Degradation of Human values
- Economy Bankruptcy
- Deterioration of Law and Order
- Social, Political and Economical Unrest

Effects of Global Warming

Rising Sea Level



Increased Temperature



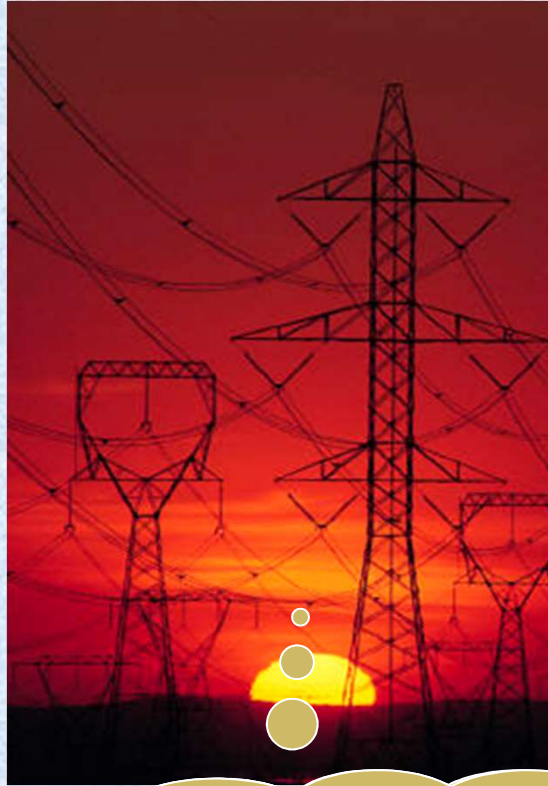
Habitat Damage and Species Affected



Changes in Water Supply

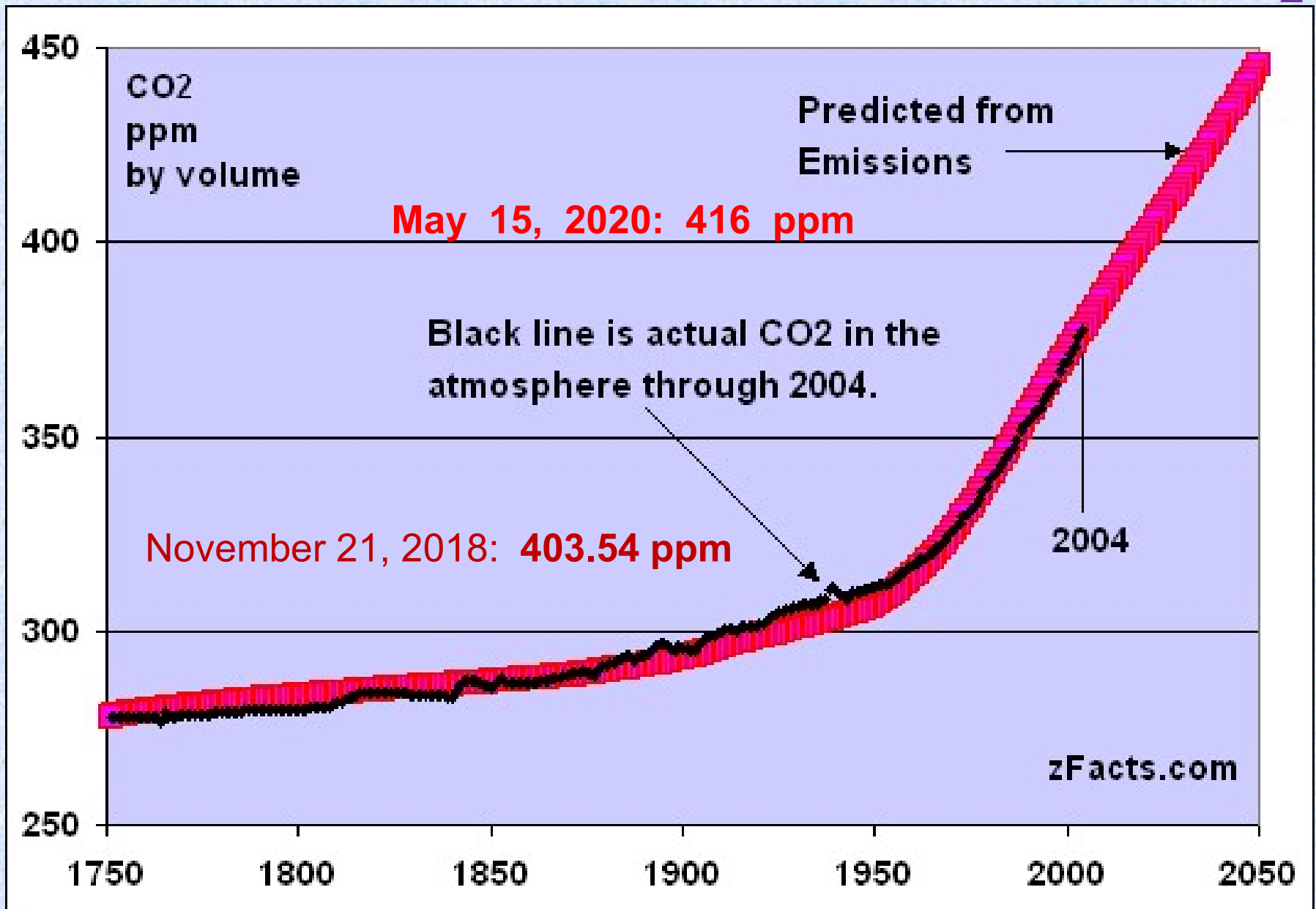


Burning of Fossil Fuels



**Pollution from coal,
natural gas, and oil**

Global Atmospheric Concentration of CO₂



What are the causes of these problems?

- Excess exploitation of natural resources by man armed with power of modern science and technology.
- Wrong philosophy of science and technology
- Wrong philosophy of life.
- Society controlled by the greedy market forces.
- Lack of leadership with proper vision
- Intellectual bankruptcy
- Degradation of human value system
- Wrong educational methodology
- Lack of spirituality

What are the solutions ?

- ❑ Look back to our cultural Heritage which thrives for thousands of years.
- ❑ Try to investigate ancient Scientific Heritage of our civilization.
- ❑ Redefine the philosophy of science and technology
- ❑ Redefine our individual life.
- ❑ Reshape collective lives of our society

Glimpses of Ancient Indian Technology

Indus Valley Civilization

Harappan engineers followed the decimal division of measurement for all practical purposes, including the measurement of mass.



Indus Valley utencil

in April 2006, it was announced in the scientific journal “**Nature**” that the oldest (and first early Neolithic) evidence for the drilling of human teeth *in vivo* (i.e., in a living person) was found in **Mehrgarh**, Pakistan. **Eleven drilled molar crowns from nine adults** were discovered in a Neolithic graveyard in Mehrgarh that dates from **3,500-5,000 years ago**. According to the authors, their discoveries point to a tradition of **proto-dentistry** in the early farming cultures of that region.



Red pottery with red and black slip-painted decoration.



The "dancing girl of Mohenjo Daro"

Certain Ancient Indian Technologies

- Agriculture Engineering
- Languages and Grammar
- Metrology
- Civil Engineering and Architecture
- Metallurgy and Metal Manufacturing
- Mining Engineering
- Mechanical Engineering.
- Paper Technology
- Textile Technology
- Chemical Technology
- Ship Building and Navigation
- Ayurveda, Surgery and Yoga
- Music and Its Instrument
- Astronomy and Astrology

Problems with Modern Agricultural Farming:

- Artificial fertilizers and herbicides washed from the soil and pollute rivers, lakes and water resources.
- It results in soils with a low organic matter content.
- **Greater amounts** of fertilizers needed every year to produce the same yields of crops.
- **Artificial pesticides** can stay in the soil for a long time and enter the food chain.
- **Artificial chemicals** destroy soil micro-organisms resulting in poor soil structure and aeration and decreasing nutrient availability.
- **Pests and diseases** become more difficult to control as they become resistant to artificial pesticides.
- **Habitat losses.**

What is the solution ?

Natural Farming What is natural farming?

Natural farming is as old as Indian Civilization.
It is the process of farming developed and **professed by our ancestors**

- British survey of 2000 villages of Chengalpattu, Tamilnadu (1762-1766).
- Yielding was **12 tons of paddy a hectare**

It is the process of cultivation which **works in harmony with nature** unlike modern farming **that works against nature**

This process helps to achieve good crop yields without harming the Natural Environment/habitats (**man/animal/insects/microorganism/plants/air/water/etc**)

Ref: Annam Bahu Kurvita by JK Baja & MD Srinivas, Centre for Policy Studies, 1996 (<http://cpsindia.org/index.php/pub/96-annam-bahu-kurvita>)

Food Quality : Natural vs Conventional

Vegetables Type of Soil Management	Minerals (in milliequivalents)						
	Calcium	Magnesium	Potassium	Sodium	Manganese	Iron	Copper
Snap Beans							
Organic	40.5	60.0	99.7	8.6	60.0	227.0	69.0
Conventional	15.5	14.8	29.1	0.0	2.0	10.0	3.0
Cabbage							
Organic	60.0	43.6	148.3	20.4	13.0	94.0	48.0
Conventional	17.5	15.6	53.7	0.8	2.0	20.0	0.4
Lettuce							
Organic	71.0	49.3	176.5	12.2	169.0	516.0	60.0
Conventional	16.0	13.1	53.7	0.0	1.0	1.0	3.0
Tomatoes							
Organic	23.0	59.2	148.3	6.5	68.0	1938.0	53.0
Conventional	4.5	4.5	58.6	0.0	1.0	1.0	0.0
Spinach							
Organic	96.0	293.9	257.0	69.5	117.0	1584.0	0.0
Conventional	47.5	46.9	84.0	0.8	1.0	19.0	0.5

Research conducted by Firman E. Bear,
Rutgers University in the Natural Gardener's Catalog (1995)

Water Irrigation System In Ancient India

Problems with Modern Irrigation System:

- Displacement of villages and poor and downtrodden people.
- Quite Expensive and maintenance problem
- Threat to life of dam due to silting Problem
- Reduction in agricultural land and agricultural production by the land taken by dam system
- Harming Marine life of the delta
- Pollution of river water and other water bodies. Deterioration of soil around delta.
- Artificial flood is created.
- **Habitat losses.**

Introduction to Grand Anicut



Grand anicut was built at just downstream of the confluence of river Kollidam and Cauvery by Chola King Karikalan between 100 BCE to 100 CE.

The area irrigated by the ancient irrigation network is about 69,000 acres (28,000 ha). By the early 20th century, the irrigated area had been increased to about one million acres.

The Grand Anicut was renovated in 1838 and this measure immediately proved to be a great success. Later Cotton [1874: 23-26] paid this tribute:

... it was from them (the native Indians) we learnt how to secure a foundation in loose sand of unmeasured depth. In fact, what we learnt from them made the difference between financial success and failure, for the Madras river irrigations executed by our engineers have been from the first the greatest financial successes of any engineering works in the world, solely because we learnt from them ... With this lesson about foundations, we built bridges, weirs, aqueducts , and every kind of hydraulic work ... we are thus deeply indebted to the native engineers.

Can we make roof of house with bricks only ?



**Shivrajpur
Temple, Kanpur**

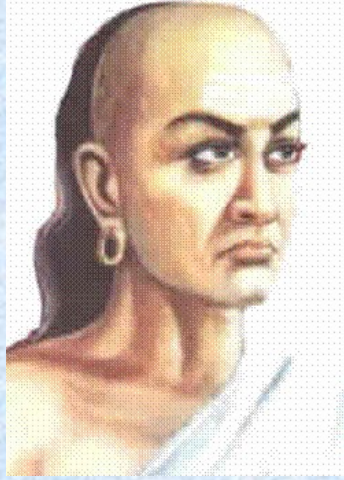


Rustless Iron Pillar at Delhi

Chandra Gupta II (400-413 Ce)
had erected in the honor of
Visnu on the Mount
Vishnupada.



Inverted Kalash



नवेन अनवं शोधयेत् । कौटिल्य

Relook at the Past
Heritage with Modern
outlook.

View of Few Scholars

The Indian way of life provides the vision of the natural, real way of life. We veil ourselves with unnatural masks. On the face of India are the tender expressions which carry the mark of the Creator's hand.

George Bernard Shaw

Moral of Story

We need to relook, revive and rejuvenate the ancient technological culture and heritage of our glorious mother land.

Jai Hind.