MECHBUZZ!!!

DEPARTMENT OF MECHANICAL ENGINEERING, VASAVI COLLEGE OF ENGINEERING, HYD.
July 2018 ISSUE 3

BACTERIA WIND FARM

Wind farms are getting bigger and bigger and are producing more even more power as they grow. But sometimes, bigger isn't always better. As per the paper published by the *Science Advances* magazine, researches described a mathematical stimulation of a "Bacterial Wind Farm" like any moving creature immersed in a fluid. Bacteria can whip up the flow, but the flow created by groups of bacteria is turbulent, unorganised and useless, like a choppy chaotic water of an over-populated pool party.

These dense bacterial suspensions contain micro-organisms which swim in an active yet unorganized flow. The flow of bacteria is so disordered that it has been considered to be too chaotic for their extraction. But, if we line up those bacteria into a nice little array, the fluid they are in will begin to flow in an organized and useful manner. Scientists have effectively demonstrated that micro-organisms can be used to create microscopic wind farms which can generate tiny amount of power which is required for the functioning of organisms.

To create the most orderly flow, scientists have found the difference between the functioning of rotors with the fastest spinning and to that with the greatest potential for power generation. If the discs are far from each other, then they only spin which causes turbulence. On the other hand, if they are too close, then the size of swirls in flow will be larger than the space between them. Hence, the discs are to be placed in an appropriate position so that the size of the swirl and the space between the discs are equal. (Cont..page2)

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ORACLE:-

"In experimental philosophy, propositions gathered from phenomenon by induction should be considered either exactly or very nearly true notwithstanding any contrary hypotheses, until yet other phenomena make such propositions either more exact or more liable."

-Isaac Newton

BACTERIA WIND FARM (contd..)

So a team of scientist used computer simulations to show how dense chaotic swarms of bacteria are able to organize into a group to turn cylindrical rotors and provide a steady stream of power. When the Oxford researchers sank a microscopic lattice of 64 symmetric rotors into the bacterial fluid, they found the bacteria spontaneously organized itself so that each rotor began to spin in the opposite direction of its neighbor.

"When we did the simulation with a single rotor in the bacterial turbulence, it just got kicked around randomly. But when we put an array of rotors in the living fluid, they suddenly formed a regular pattern, with neighboring rotors spinning in opposite directions." *(Source: www.ox.ac.uk)*

CONVERSION OF SMOG INTO DIAMONDS:

Day to day human necessity is increasing, due to which we are expelling substances which are very dangerous to the living organisms. Every activity of humans requires energy which mainly depends on fossil fuels, which at the end liberates harmful products that cause a lot of damage to the Earth.

The world's most polluted country in world is China, and India stands in the 3rd position. Dutch artist and designer Daan Roosegaarde's "Smog Free Tower" has debuted in the Chinese capital-Beijing which can clean 30,000 cubic meters of air in an hour. That means, in one-and-a-half days, it can clean the air contained in a typical football stadium. Using a positive ionization process, the air-cleaning tower captures tiny particles suspended in the air and filters them out. Since more than 40% of the collected pollution is Carbon, he has struck on a novel innovation by using high pressure to convert the residue to diamonds, which can be sold as jewelry.

Just one of the 23-foot high towers is currently in operation. But as China looks to invest more money in reducing pollution and improving quality of life. "You could say it's the largest smog vacuum cleaner in the world," Roosegaarde told the *Bloomberg Television*. "China will invest billions and billions of dollars in the war on smog. They have been doing that and they will be doing that and we are definitely part of that."

(Source : www.weforum.org)

STUDENTS' SPEAK

CORRUPTION AND IT'S ANALYSIS

Robert Klitgard is one of the giants of academic anti corruption research over the last half century. He coined the famous "Corruption Formula" which is : C= M+D—A.(corruption equals monopoly plus discretion minus accountability).

It is an elegant generalization of corruption, especially the forms which arise when officials are given sole power to make consequential decisions without adequate over sight or control and stating that more over sight and more democratic checks (accountability) will reduce corruption. It reflects the dictum that power tends to corrupt, and absolute power corrupts absolutely.

This formula has it's limitations though. In Klitgard's own words "The formula was in midst of a much detailed analysis of the principal-agent-client relationships and attempt to provide a "check list for policymakers" that ranged from selecting agents to enhancing moral climate." So the formula has it's limitations and it is often misleading.

In sum, while Klitgard's is indisputably right that some corruption arises because unaccountable officials have the sole power to make discretionary decisions, but framing this point as a universal formula is inaccurate.

APPLICATION OF KLITGARD'S FORMULA:-

Q. What are different ways in which people are corrupt?

A. Some of the reasons are:

- Regulations and authorizations
- Misplaced moral (lack of moral)
- Taxation
- Slow rather inefficient judicial process
- Loopholes in the system
- Rationalizing false arguments with no moral basis
- Spending decisions
- Provision for goods and services at below market prices
- Downplaying and reacting mildly against corruption
- Financing of parties
- Quality of the bureaucracy
- Level of public sector wages
- Penalty systems
- Institutional controls
- Transparency of rules and laws, etc.

(Cont..page 4)

APPLICATION:

Corruption equals monopoly plus discretion minus accountability. Less the regulations, less accountability and more corruption. Inefficient judicial system implies more discretion—sometimes monopoly too and therefore more corruption.

Misplaced moral sense is not considered in this formula because it's s psychological one.

Quality of bureaucracy is direct implication of monopoly in the system (under it's own limitations) and therefore directly proportional to corruption.

Downplaying and reacting mildly implies less democratic checks and over sight and therefore less accountability and more corruption.

Rationalizing false arguments comes under discretion and hence directly proportional to corruption.

CONCLUSION:

Klitgard's formula has very deep implications in corruption and economy. So applying it to the shallow instances quoted by an amateur like me became too heavy. Nevertheless it is an elegant generalization that perfectly makes sense in understanding the mechanism of corruption thereby paving a path showing reforms to be made to decrease corruption.

- Kartiikeya
Mech A —2/4

TECH TERMS:

WAKE: The narrow region of reduced velocity downstream of an object around which there is viscous fluid flow.

ADVECTION: The transfer of heat or matter by the flow of a fluid, especially horizontal in the atmosphere or the sea.

GIMBAL: A pivoted support that allows rotation of a supported object about a single axis.

BIZARRE FACTS!!

- Alternating current was first invented by **NICOLAS TESLA**
- Actually the four rings in Audi represents four companies of auto union (Audi, Horch, DKW and Wanderer.)
- Audi is the first company to introduce crash test and has be conducting crash test for 75 years.

B'DAYS THIS MONTH:

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 S.VenkataPrasad MechB(3/4)	2 K.Supriya MechB(3/4) Srinivas MechA(4/4)	3 S.Venkateswarulu-Faculty
4	5 V.PriyaDarshan MechB(3/4) Niharika MechB(2/4)	6 Raghu MechB(2/4)	7 Arun Kumar MechA(4/4)	8 Dheeraj MechA(3/4)	9 M.Anish MechA(3/4) Satwik MechA(3/4)	10 Ravinder MechA(3/4)
11 Hima Varsha MechB(3/4) Krishna Prasad MechA(4/4)	12	13 MILAD-U-NABI 	14 Bhavana MechA(3/4)	15 Sudheer MechA(4/4) Aravind MechA(4/4)	16 Saketh MechA(4/4)	17 K.Sai Charan MechA(4/4) Raj Kumar MechB(4/4)
18 Kartthik MechB(4/4)	19	20 B.Naga Manohar– Faculty	21	22	23	24 A.Karthik MechB(2/4)
25 	26	27 Varun MechA(3/4)	28 Pranav MechA(4/4)	29 Hrish MechA)/(	30	31 K.Pavan Kumar MechB(3/4)

EVAPORATION VS BOILING

Vaporization is conversion of state of liquid into gas.
Now why does this happen?

Because the kinetic energy or simply let's say the force holding the liquid molecules together is overcome due to to some external source (say sunlight) and they escape the confines of the liquid. Now think of it, it could happen actively by applying purposeful a source, like a burner or passively that is naturally.

Evaporation and Boiling are two processes that are looked upon often without difference. Strictly speaking there is difference between the two processes. Evaporation occurs on the surface of the liquid whereas boiling occurs in the liquid in its entirety. This is the main difference between evaporation and boiling.

(Source: www.quora.com)

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RIDDLES:

1) Who invented the BALLPOINT PEN?

A. Biro Brothers
B. Waterman Brothers
C. Bicc Brothers
D. Write Brothers

2) The hardness is the property of a material due to which it

A. can be drawn into wires
B. breaks with little permanent distortion
C. can cut another metal
D. can be rolled or hammered into thin sheets

3) The purpose of choke in tube light is ?

A. To decrease the current
B. To increase the current
C. To decrease the voltage momentarily
D. To increase the voltage momentarily

WINNER OF LAST ISSUE'S RIDDLES:

-Swapnika. V
MechB 3/4

HAPPY HOLIDAYS!!! :)

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