



**TATHASTU**  
Institute of Civil Services

# DAILY CURRENT AFFAIRS



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**PROPERTY IS REAL, AND SO SHOULD THE 'COMPENSATION'**

# Property is real, and so should the 'compensation'

A oft-quoted maxim in relation to property rights is that of President John Adams: "Property is surely a right of mankind as real as liberty". The right to property – initially envisaged as a fundamental right and later as a constitutional right – has witnessed an interesting history in the post-colonial era. No other right as enshrined in the Constitution has witnessed a tussle as fierce as between courts and the legislature.



**N. Anand Venkatesh**  
is Judge,  
Madras High Court

The genesis of this power struggle dates back to the case of Bela Banerjee which involved the interpretation of Articles 19(1)(f) and 31(2) of the Constitution (prior to amendment). The Supreme Court of India held that the word compensation in Article 31(2) postulated "a just equivalent of what the owner has been deprived of". To undo this interpretation, the Constitution (Fourth) Amendment was passed in 1955 amending, *inter alia*, Article 31(2) to expressly state that the courts could not delve into the question of inadequacy of compensation.

To retaliate, the courts then devised an ingenious plan: they held that although the final compensation was non-justiciable, the principles fixed by the legislature to arrive at such determination would be open to scrutiny.

**Word substitution**

Parliament, for its part, realised that the word "compensation" in Article 31(2) was the source of all mischief. *Vide* the Constitution (Twenty-Fifth) Amendment Act, 1971 the word "compensation" was substituted by the word "amount" which kept the interpretation of the courts at bay. Thus, acquisition of property could now be effected through the medium of eminent domain (the state) by paying the landowner an "amount" (as distinguished) from "compensation". The adequacy of such "amount" was consequently not open to judicial review.

Though the validity of the Constitution (Twenty-Fifth) Amendment Act, 1971 was upheld in Kesavananda Bharati, the Supreme Court watered down the intended effect of the amended Article 31(2) by an interpretive process.

The majority in Kesavananda Bharati took the view that though the adequacy of the amount paid was not justiciable, the courts could still examine whether the principles fixed for determining such compensation were relevant which in effect, reinstated what Justice Shah had said in the bank nationalisation case. After this decision, Parliament was convinced that the right

to property remained a proverbial thorn in the goal of achieving a socialist state. This was because the right to property, from a socialist point of view, was very much a citadel of the bourgeoisie.

**A significant change**

After the defeat of the Congress in the general election of 1977, the Janata Party, which came to power, passed the Constitution (44th Amendment) Act, 1978. The right to property under Article 19(1)(f) was deleted from Part III and rehabilitated in the form of a constitutional right under Article 300-A. Article 31, which had witnessed much controversy in the matter of the determination of compensation was also deleted. The ripple was felt instantly.

Justice K.K. Mathew, who was one of the dissenting judges in Kesavananda Bharati, observed that ownership of property has a direct co relation to the quality of the civilisation and its culture and hence opined that "...there is no justification to exclude the fundamental right to own and acquire property from the category of basic features of the Constitution even if it be assumed that the concept of basic structure is a tenable one".

In 1980, Professor P.K. Tripathi wrote an influential article, arguing that the deletion of Article 31 was a folly and further that: "The power granted by Entry 42 of the concurrent list is the power to 'acquire' and not the power to 'confiscate'. As long as these two conditions – namely, that acquisition can be for a public purpose only and that acquisition must be accompanied by compensation – were expressly incorporated in the provision of Article 31(2), it was not necessary, and perhaps not even permissible, to invoke them as inherent parts of the grant itself..."

Article 300A reads that "no person shall be deprived of his property save by authority of law". This, according to Prof. Tripathi, still meant that the "law" cannot be valid unless the acquisition or requisitioning is for a public purpose and there is also a provision in the law for paying compensation.

In that sense he believed that "compensation" will continue to have the same meaning given in the case of Bela Banerjee, namely, which is the market value of the property concerned at a time not too remote from the date of period of acquisition.

In the years that have followed the deletion of

Articles 19(1)(f) and 31, the Supreme Court has held that the right to property is not only a constitutional right but also a human right. In the case of M.C. Mehta, the Supreme Court held that to be a valid law, it must be just, fair and reasonable. In other words, though the right to property was not a fundamental right, a law which deprived a person of his property must answer to the requirements of Articles 14, 19 and 21. In B.K. Ravichandra, the Court went a step further and observed that the phrasing of Article 300A had a striking resemblance to Articles 21 and 265 and hence its guarantee could not be read down.

**Facets that are protected**

The recent decision of the Supreme Court in Kolkata Municipal Corporation has fleshed out seven different facets which are protected under Article 300-A. These are: The right to notice; the right to be heard; the right to a reasoned decision; the duty to acquire only for public purpose; the right of restitution or fair compensation; the right to an efficient and expeditious process; the right of conclusion.

The Court has concluded that the absence of even one of these features would render the law susceptible to challenge. The right to restitution or fair compensation judicially affirms the position prevailing when the unamended Article 31 was in force, and the interpretation expounded in the Bela Banerjee case on the aspect of payment of compensation. A person deprived of land by the state in the exercise of its power of eminent domain is entitled to be paid compensation which is just and reasonable. The Court, in Kolkata Municipal Corporation, has reiterated that deprivation or extinguishment of that right is permissible only upon restitution, be it in the form of monetary compensation, rehabilitation or similar means. Thus, the requirement of paying compensation. i.e., money's worth of the property acquired, which was the original position in the Bela Banerjee case has now been reinstated. The wheel has come full circle.

The decision in Kolkata Municipal Corporation vindicates the prophetic words of Prof. P.K. Tripathi, that in enacting the Forty-Fourth Amendment and deleting Articles 19(1)(f) and 31, Parliament has unwittingly given the property of a citizen the kind of protection it has never enjoyed before either in British or in independent India.

*Vocab  
Fenable  
folly*

With the decision in 'Kolkata Municipal Corporation', the wheel has come full circle



## Points To Note-

- What is Right Property
- Bela Bannayi case
- Constitutional provisions before Amendments  
( Art 19(1)(f) and Art 31(2) )
- 1st CAA → Art 14, 19, 21
- 4th CAA → Article 30
- 25th CAA
- Evolution through various judgements
- 44th AA (Art 300A)
- Recent judgement of SC in Kolkata Municipal Corporation case (7 subrights of right to property)
- Reserve stance

## Additional readings

Doctrine of Adverse possession  
Doctrine of eminent domain

Difference b/w FR, constitutional rights and legal rights

### Right to Property is a Legal Right:

- ❖ Article 300A of the Constitution makes the right to property a legal right. It allows the state to acquire property under two conditions
  1. The acquisition should be for a public purpose.
  2. It should provide for payment of compensation to the owner.
- ❖ The present status of the Right to Property is that it is a legal right and not a constitutional right. This means that it can be regulated, abridged, or curtailed by law without the constitutional amendment.



It also means that in the event of a violation of this right, an individual or a party cannot approach the Supreme Court for the issuance of a Writ. However, one can always approach the High Court and file a petition.

- ❖ Although the right to property is still immune from executive action, it is not so from legislative action. In other words, if the Parliament passes a law to this effect, the acquisition of private property by the state is legally justified. Also, there is no guaranteed right to compensation in the event of the state acquiring the property under the legislation passed by the Parliament

#### UPSC Practice Question:

##### Q.1 What is the position of the right to property in India?

- (a) Legal right available to citizens only
- (b) Legal right available to any person
- (c) Fundamental Right available to citizens only
- (d) Neither Fundamental Right nor legal right

Ans: B

##### Q.2 Consider the following statements regarding Right to Property:

1. Right to property is legal right but not a Fundamental Right.
2. Article 300 A was inserted in the Constitution of India by the 44<sup>th</sup> Constitutional Amendment.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) Only 2
- (c) Both
- (d) None

#### Doctrine of Adverse Possession

- ❖ It is a legal doctrine that allows a person who possesses or resides on someone else's land for an extended period of time to claim legal title to that land.
- ❖ In India, a person who is not the original owner of a property becomes the owner because of the fact that he has been in possession of the property for a minimum of 12-years, within which the real owner did not seek legal recourse to oust him.
- ❖ The state cannot trespass into the private property of a citizen and then claim ownership of the land in the name of 'adverse possession'.
  - ☛ Grabbing private land and then claiming it as its own makes the state an encroacher.

#### Doctrine of Eminent Domain:

- ❖ It is power of the sovereign to acquire property of an individual for public use without the necessity of his consent.
- ❖ This power is based on sovereignty of the State.
- ❖ Payment of just compensation to the owner of the land which is acquired is part of exercise of this power.



### What is Right to Property under Constitution of India?

- ❖ Initial Position of Right to Property:
  - ☛ The Right to Property was initially recognized as a fundamental right under Article 19(1)(f) and Article 31 of the Constitution of India.
  - ☛ These provisions guaranteed citizens the right to acquire, hold, and dispose of property, and prohibited the deprivation of property without the authority of law.
- ❖ 1st Amendment (1951):
  - ☛ Recognizing the need for agrarian reforms and addressing social inequalities, the Constitution (First Amendment) Act, 1951, amended Article 19(1)(f) and Article 31, paving the way for the government to impose restrictions on the right to property in the interest of the general public.

### Constitution (Twenty-Fifth) Amendment Act, 1971

- ❖ The word “compensation” was substituted by the word “amount” which kept the interpretation of the courts at bay. Thus, acquisition of property could now be effected through the medium of eminent domain (the state) by paying the landowner an “amount” (as distinguished) from “compensation”. The adequacy of such “amount” was consequently not open to judicial review.
- ❖ 44th Amendment (1978):
  - ☛ The most significant change came with the 44th Amendment Act, 1978, which altered the constitutional landscape by abolishing the fundamental right to property altogether.
  - ☛ Article 19(1)(f) and Article 31 were omitted with effect from 20th June 1979.
  - ☛ The 44th Amendment Act inserted a new provision, Article 300-A, which acknowledged the right to property as a legal right rather than a fundamental right.
- ❖ Current Status:
  - ☛ As of the present constitutional framework, the Right to Property is primarily governed by Article 300-A of the Constitution of India.
  - ☛ Article 300-A states that no person shall be deprived of his or her property save by authority of law.
  - ☛ Unlike the earlier provisions, the current stance emphasizes that the right to property is not absolute and can be regulated by law.

### What the Landmark Cases Related to Right to Property?

- ❖ A K Gopalan v. State of Madras (1950):
  - ☛ This case, heard by the Madras HC, was one of the early instances where the court grappled with the conflict between the right to property and the state's power to regulate it.
  - ☛ The court upheld the constitutionality of the Madras Maintenance of Public Order Act, 1949, which authorized the state to take possession of any property for public order.
- ❖ Kesavananda Bharati v. State of Kerala (1973):
  - ☛ This case is often referred to as the "basic structure doctrine" case.
  - ☛ While not directly related to the right to property, it is crucial in understanding the constitutional context.
  - ☛ The Supreme Court, in a historic decision, held that while the Parliament has the power to amend the Constitution, it cannot alter its basic structure.



- This case indirectly influenced the subsequent amendment that transformed the right to property into a legal right.
- ❖ **Minerva Mills Ltd. v. Union of India (1980):**
  - In this case, the Supreme Court struck down parts of the 42<sup>nd</sup> Amendment Act, 1976, which gave Parliament unbridled power to amend the Constitution.
  - The court, while upholding the amendment abolishing the fundamental right to property, emphasized that even though the right to property is no longer a fundamental right, it continues to be a constitutional right.
- ❖ **Jilubhai Nanbhai Khachar v. State of Gujrat (1995):**
  - SC held that the Right to Property is not a part of the Basic Structure Doctrine of the Constitution.





## PRESTON CURVE

### KEYWORD

# *What does the Preston curve postulate?*

### Prashanth Perumal

The Preston curve refers to a certain empirical relationship that is witnessed between life expectancy and per capita income in a country. It was first proposed by American sociologist Samuel H. Preston in his 1975 paper “The changing relation between mortality and level of economic development”. Preston found that people living in richer countries generally had longer life spans when compared with people living in poorer countries. This is likely because people in wealthier countries have better access to healthcare, are better educated, live in cleaner surroundings, enjoy better nutrition etc. When a poor country begins to grow, its per capita income rises and causes a significant increase in life expectancy initially as people are able to consume more than just subsistence calories, enjoy better healthcare etc. The average per capita income of Indians rose from around ₹9,000 per year in 1947 to around ₹55,000 per year in 2011. During the same period, the average life expectancy of Indians rose from a mere 32 years to over 66 years.

However, the positive relationship between per capita income and life expectancy begins to flatten out after a certain point. In other words, an increase in the per capita income of a country does not cause much of a rise in the life expectancy of its population beyond a point, perhaps because human life span cannot be increased indefinitely.

### **Problems in the curve**

Experts, however, have disagreed over the causal relationship between income levels and human development indicators. Many economists have used this positive relationship to argue that the way to improve development outcomes in a country is to encourage economic growth. The rapid economic growth of India and China over the last few decades, which has helped improve life expectancy and other development indicators, has been cited as an example of faster economic growth leading to better development outcomes. Other experts, meanwhile, have argued that most improvements in life expectancy have come from a shift in the Preston curve rather than due to a movement along the curve. That is, higher life expectancy has been achieved by countries even at low per capita income levels. Such improvement in life expectancy at low income levels, according to these experts, could be due to improvements in medical technology, such as the development of life-saving vaccines. So, in this view of the Preston curve, improvement in life expectancy and other development outcomes is seen as the result of public investment in human development. Critics of this view however, argue that technological advancement itself is linked

### **Q.3 Consider the following statements with respect to ‘Preston Curve’**

- 1 It is are lationship between development and health
- 2 Life expectancy is plotted against GDP per capita

Select the correct code

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Ans. C**



## HYDROXYUREA TO TREAT SICKLE CELL DISEASE

# ICMR seeks to provide oral formulation of hydroxyurea to treat sickle cell disease

**Bindu Shajan Perappadan**  
NEW DELHI

The Indian Council of Medical Research (ICMR) has invited Expressions of Interest (EoI) from eligible organisations for the “joint development and commercialisation” of a low dose or paediatric oral formulation of hydroxyurea to treat sickle cell disease in India.

India has the highest prevalence of sickle cell disease in South Asia. Over 20 million people with the disease live in the country. While most pharmaceutical companies in India market 500-mg capsules or 200-mg tablets of hydroxyurea, the biggest challenge in treatment is that it is not available in the suspension form for effective use in the case of paediatric patients, the ICMR said.

Sickle cell disease is one



Over 20 million people with sickle cell disease are residing in India. AP

of the most common monogenic disorders of haemoglobin, and hydroxyurea, a myelosuppressive agent, is an effective drug for treating patients of sickle cell disease, and thalassemia.

### Risk of low dose

The ICMR said that since only high-dosage hydroxyurea tablets are available, initiating a low-dose treatment becomes a tedious

task for service providers, as the capsule or tablet has to be broken down appropriately to be administered in accordance with body weight, risking the efficacy available with measured doses.

“Thus, there is a need for paediatric formulation of HU (hydroxyurea), considering the number of SCD cases in India and in view of the launch of the National Mission to eliminate Sickle Cell Anaemia/SCD (by 2047),” it said.

The ICMR, which is the apex biomedical research body in the country, also said that in India, according to the National Health Mission’s guidelines, healthcare providers initiate hydroxyurea therapy to only symptomatic sickle cell disease patients among children both because of the lack of availability of paediatric doses as well as the fear of toxicity.

In children, the prescribed dose is 10 mg to 15 mg per kilogram of body weight after two years of age. This titration of dose is difficult, and currently, it is carried out by using a fraction of the broken capsules, which is not an appropriate method because it can lead to less accurate administration of the drug, which has five dose-related side-effects.

### Titration of drug

With the availability of a formulation, the titration of the drug can be better, and its dose-related side effects can be reduced.

The council said that it could enter into any form of exclusive or non-exclusive agreement with eligible manufacturing companies for joint development and commercialisation of paediatric oral formulations of hydroxyurea for sickle cell disease.

## What is Sickle-Cell Disorder?

### ❖ About:

- Sickle Cell Disease (SCD) is an inherited haemoglobin disorder characterised by a genetic mutation that causes red blood cells (RBCs) to assume a sickle or crescent shape rather than their normal round shape.
- ❖ This abnormality in RBCs results in increased rigidity, impairing their ability to circulate effectively throughout the body. Consequently, individuals with SCD often experience complications such as anaemia, organ damage, recurrent and severe pain episodes, and a shortened lifespan.
  - As per the Ministry of Health and Family Welfare, marginalised tribal populations are most vulnerable to SCD.
- ❖ Symptoms: Symptoms of sickle cell disease can vary, but some common symptoms are-
  - Chronic anaemia which leads to fatigue, weakness, and paleness.
  - Painful episodes (also known as sickle cell crisis) cause sudden and intense pain in the bones, chest, back, arms, and legs.





- Delayed growth and puberty.
- ❖ Treatment Processes:
  - Blood Transfusions: These can help relieve anaemia and reduce the risk of pain crises.
  - Hydroxyurea: This medication can help reduce the frequency of painful episodes and prevent some of the disease's long-term complications.
  - Gene Therapy: It can also be treated by bone marrow or stem cell transplantation by methods like Clustered regularly interspaced short palindromic repeats (CRISPR).

**Practice:**

**Q.4 With reference to Sickle Cell Disease, consider the following:**

1. It is an inherited blood disorder which affects the red blood cells.
2. It can cause damage to organs including the liver, kidney, lungs, heart and spleen.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Answer: C**

**Notes:**

- ❖ **Both statements are correct.**
- ❖ **Statement 1 is correct:** It is an inherited blood disease which is most common among people of African, Arabian and Indian origin. It is a group of disorders that affects hemoglobin, the molecule in red blood cells that delivers oxygen to cells throughout the body.
- ❖ **Statement 2 is correct:** Over time, people with sickle cell disorders can experience damage to organs including the liver, kidney, lungs, heart and spleen. Death can also result from complications of the disorder.



**CLAUDIA SHEINBAUM..MEXICO'S FIRST WOMAN PRESIDENT**

# Claudia Sheinbaum makes history as Mexico's first woman President

The Leftist leader won votes between 58.3% and 60.7%, while her immediate rival got 26.6-28.6% votes, according to election authorities; an anointed successor of outgoing President Obrador, she says govt. should have a role in addressing inequality

**Associated Press**  
MEXICO CITY

**C**laudia Sheinbaum will become the first woman President in Mexico's 200-year history.

Ms. Sheinbaum, the favoured successor of outgoing President Andrés Manuel López Obrador, vowed to continue in the direction set by the populist leftist leader. But the cool-tempered scientist offers a sharp contrast in style – and a break with Mexico's male-dominated political culture.

"I promise that I am not going to let you down," Ms. Sheinbaum said, greeting supporters in Mexico City's



**Elated face:** Claudia Sheinbaum celebrates following the results of the general election at Zocalo Square in Mexico City on Monday. AFP

colonial-era main plaza, the Zocalo.

The National Electoral Institute's president said Ms. Sheinbaum had between 58.3% and 60.7% of the vote, while opposition

candidate Xóchitl Gálvez had between 26.6% and 28.6% and Jorge Álvarez Máynez had between 9.9% and 10.8% of the vote. Ms. Sheinbaum's Morena party was also projected to hold

its majorities in both chambers of Congress.

The climate scientist and former Mexico City Mayor said her two competitors had called her and conceded her victory.

The official preliminary count put Ms. Sheinbaum 28 points ahead of Ms. Gálvez with nearly 50% of polling places reporting.

**Six-year term**

"As I have said on other occasions, I do not arrive alone," Ms. Sheinbaum said shortly after her victory was confirmed. "We all arrived, with our heroines who gave us our homeland, with our mothers, our daughters and our granddaughters."

Ms. Sheinbaum will also be the first person from a Jewish background to lead the overwhelmingly Catholic country. She will start her six-year term October 1. Mexico's Constitution does not allow re-election.

The Leftist has said she believes the government has a strong role to play in addressing economic inequality and providing a sturdy social safety net, much like her political mentor. Mr. López Obrador's anointed successor, the 61-year-old Ms. Sheinbaum consistently led in the polls despite a spirited challenge from Ms. Gálvez. This was the first time in Mexico that the two main opponents were women.





**HOW ALTRUISM AROSE IN NATURE..SCIENCE**

# 'Green-beard' genes could explain how altruism arose in nature

Amoebae don't use rational numbers. Instead, they use genes to estimate kinship with other amoebae. If the genes have not diverged at all, or have diverged very little, there is kinship and it is good to cooperate. If they have diverged significantly, there is less kinship and hence cooperation is risky

**D.P. Kasbekar**

**A**ltruism is widespread in nature. Worker honey bees devote their entire life to foraging and caring for their sister, the queen, and her offspring, but do not themselves reproduce. In widow spiders, a male allows a female fertilised by him to eat him, and thus nourish herself and her offspring. A meerkat, a mongoose found in Africa, assumes the role of a sentinel, perching itself on a mound or rock, keeping a lookout for predators, instead of foraging for food, while the rest of the clan is feeding. If a predator is sighted, it alerts the others.

Many humans themselves have agreed that "greater love has no man than he who lays down his life for his friends".

How can the emergence of altruism in all these diverse forms be explained?

**A genetic switch**

Most of the progress in answering this question has come from studies of a simpler organism that has been easier for researchers to study: the social amoeba *Dictyostelium discoideum*. The take-home message of these studies is that if a gene makes a worker bee altruistic, it also helps the copy of the gene in the queen and her offspring to be passed on to the next generation, even if the worker herself does not reproduce.

Such so-called 'green-beard' genes allow the individuals bearing them to recognise and preferentially cooperate with each other.

Alternatively, a green-beard gene could provoke individuals to behave harmfully towards those carrying a different version of the gene.

Thus, scientists have postulated, green-beard genes encode some kind of tag that helps the genome to know their identity (i.e. self-recognition).

**Altruistic amoebae**

*Dictyostelium discoideum* is a free-living, fast-growing, unicellular amoeba. In the wild, it feeds on bacteria that grow on decaying vegetation. In the laboratory, researchers have been known to feed them a bacterial 'lawn' grown in a Petri dish. When the bacteria run out, the amoebae stop multiplying and gather in the hundreds of thousands to form multicellular aggregates visible to the naked eye.

The aggregates then transform into fruiting bodies, each a few millimetres tall. A fruiting body is composed of a slender stalk made of dead cells, and it holds aloft a droplet of spores. About 20% of the amoebae in an aggregate altruistically sacrifice themselves to form the stalk. The remaining 80% become the spores.

Small fauna, such as ants and earthworms, disperse the spores to new food sources where they germinate to release amoebae. The newly released amoebae then go on to repeat the cycle of growth, division, and dispersal.

**Beware of cheaters**

Not all the amoebae in an aggregate necessarily share kinship. Some could be only distantly related, so the aggregates can potentially be genetic chimaeras – structures in which not all amoebae have the exact same genome. And when the



A view of *Dictyostelium discoideum* bacteria aggregating under a microscope. PUBLIC DOMAIN

genome differs, there is a risk that some strains may have found a way to 'cheat' and avoid becoming stalk cells, and as a result become represented in more than their fair share among the spores.

How does *D. discoideum* ensure that cheaters do not prosper?

In 2017, researchers from the University of Manchester, in the U.K., reported that two genes in the *D. discoideum* genome – called *tgrB1* and *tgrC1* – displayed all the properties one would expect in a green-beard gene. On May 11 this year, researchers at the Baylor College of Medicine in the U.S. reported evidence that *D. discoideum* amoebae use these genes to navigate the risk of chimerism.

Their findings demonstrate how sophisticated genetic machinery can confer these deceptively simple life-forms the ability to express a universal virtue.

Both these studies were published in the journal *Nature Communications*.

**Separating kith from kin**

The *tgrB1* and *tgrC1* genes are located next to each other in the *D. discoideum* genome, and are expressed together (so if one isn't expressed, the other isn't either). They contain information for cells to make two cell surface proteins called TgrB1 and TgrC1. The TgrB1 protein on one cell binds to the TgrC1 protein on another. If the binding is strong, the TgrB1 protein is activated, and confers altruistic behaviour – manifesting as the amoeba's willingness to form the stalk.

The binding between the TgrB1 and the TgrC1 proteins of cells of the same strain



The study demonstrated the logic that green-beard genes use to produce altruism plus the corresponding ability to keep altruistic amoebae from being exploited by greedy ones

is strong, and leads to self-recognition and cell-cell cooperation. Pure cultures of cells that lack the *tgrB1* and *tgrC1* genes fail to develop because they are unable to recognise each other as being alike.

The *tgrB1* and *tgrC1* genes are also very polymorphic: within the same population of *D. discoideum* amoebae, they have multiple variants. In fact, they are among the most variable genes in the *Dictyostelium* genome. When the researchers in the 2017 study examined 20 strains of the amoeba isolated from a common location, they found 18 different variants of each gene.

The researchers were able to correlate differences in the *tgr* gene sequences between two strains to the efficiency with which their cells segregated from each other in mixed aggregates and formed separate fruiting bodies. Specifically, when the binding of TgrB1 and TgrC1 proteins across the cells of diverged strains was weak, TgrB1 failed to be activated, and the cells split away from each other instead of cooperating.

When the researchers deleted the *tgrB1* gene but left the *tgrC1* gene intact, the

amoeba did not cheat on 'non-self' amoebae that carried a different *tgrC1*. Instead, it cheated those with the same *tgrC1* variant as itself – i.e. its kin. Every family has its black sheep!

**From Haldane to Voltaire**

On the other hand, amoebae in which the researchers activated the *tgrB1* gene alone (by introducing a mutation) were relegated to the stalk when mixed with their kin.

These findings demonstrate the logic that green-beard genes use to produce altruism plus the corresponding ability to keep altruistic amoebae from being exploited by greedy ones.

The British-Indian geneticist J.B.S. Haldane (1892-1964) is reputed to have said that he would jump into a river to save eight cousins but not seven – but also that he would jump in to save two brothers, yet not one. His quip highlights the fact that we share one-half of our genes with a sibling and one-eighth with a first-cousin.

As far as we know, amoebae do not use rational numbers. Instead, they use their rapidly evolving genes to estimate kinship with other amoebae. If the genes have not diverged at all, or have diverged very little, there is kinship and it is good to cooperate. If they have diverged significantly, there is less kinship and hence cooperation is risky.

To paraphrase the philosopher Voltaire (1694-1778), if *tgr* genes did not exist, it would be necessary for the amoebae to invent them.

(D.P. Kasbekar is a retired scientist.)



### Altruism:

- ❖ Altruism or selflessness is the concern for the welfare of others. It is a traditional virtue in many cultures and a core aspect of various religious traditions and secular worldviews, though the concept of 'others' toward whom concern should be directed can vary among cultures and religions. Altruism or selflessness is the opposite of selfishness.
- ❖ The altruist dictum can be stated as: "An action is morally right if the consequences of that action are more favourable than unfavourable to everyone except the agent." Auguste Comte's version of altruism calls for living for the sake of others
- ❖ In a way, utilitarianism can result in altruism. Utilitarianism recommends acts that maximise the good of society. As the rest of society will always outnumber the utilitarian, a utilitarian will practise some form of altruism.

### Humility:

- ❖ It is recognised as a virtue in all religions. Many other virtues spring from or gather lustre from it. Humility does not mean self debasement or denying one's merits, talents and accomplishments.
- ❖ It means that we should not place ourselves on a higher pedestal than others – even when we far exceed them in talents and achievements.
- ❖ Even if one is rich and powerful, one should not feel a sense of superiority over the poor and weak. One should judge oneself in relation to one's abilities, and consider whether one has utilized them in full measure.
- ❖ One should, from a religious point of view, try to utilize one's abilities in performing duties towards God and fellow men. The fact that one has greater talents and means than others indicates that one has greater responsibilities towards them.
- ❖ Thinking about what we have done in relation to what we could have done serves as a corrective to pride and arrogance.
- ❖ Humility will enable political leaders and administrators to approach ordinary people in a polite and courteous manner. Unless public servants cultivate humility, they will be unable to show concern and consideration towards the problems of common people.
- ❖ Public servants should regard their duty as service to people. They should not regard themselves as rulers or bosses. They are trustees of power which ultimately is derived from people.

### Practice:

**Q.5 Differentiate between Altruism and Humility with sustaine examples. (150w)**