



# Daily News Analysis



- Important News Discussion
- Editorial Analysis
- Previous year Question Discussion
- Practice Questions at the end of the session
- Premiers daily **Live** at **10 AM**

BY  
**Pooja Sharma**

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**1.5 tmcft of Cauvery water reaching TN'**  
BENGALURU Karnataka Deputy Chief Minister D.K. Shivakumar told the Assembly that 1.5 tmcft of Cauvery water is flowing daily into Tamil Nadu, as per the records at the Biligundlu gauging station on the inter-State boundary. > PAGE 3

## 4 soldiers, policeman killed in Doda encounter

The counter-terrorist operation in Jammu was continuing when last reports came in. Defence Minister Rajnath Singh speaks to Army chief. 12 to 14 terrorists are estimated to be in the area. Army has been conducting operations with the police to eliminate foreign terrorists who have infiltrated into Udhampur, Doda, Kishtwar and Bhatnagar areas

**Dinakar Peri**  
NEW DELHI

Our Army personnel, including a Captain, and a Jammu and Kashmir policeman were killed in a counter-terrorist operation at Doda in Jammu that began on Monday night and was continuing late on Tuesday night. Army chief General Uday Kumar Singh briefed Defence Minister Rajnath Singh on the situation on the ground on Tuesday morning.

The Army personnel who were killed have been identified as Captain Brijesh Thapa, Naik D. Rajesh, Sepoy Bijendra, and Sepoy Ajay. This was the latest in a series of militant attacks over the past few months in Jammu and Kashmir, with terrorist activity particularly shifting to the Jammu region, which has resulted in significant casualties among civilians



Be on alert: Army jawans stand guard at Lal Daman in Doda district near the site of a gun battle, on Tuesday. SPECIAL ARRANGEMENT

and security forces. "The Minister was apprised of the ground situation and the ongoing counter-terrorist operation in Doda by the Army chief," Mr. Singh's office said in a post on X. "Indian Army stands firm with the bereaved families in this hour of grief," the Army said in its own post.

**Infiltrators in Doda**  
"Indian Army has been conducting a series of joint and coordinated operations with the police to eliminate foreign terrorists who have infiltrated and are moving in the upper reaches of Udhampur, Doda, Kishtwar and Bhatnagar areas and thereafter to Kashmir Valley," the Army's Jammu spokesperson, Lt. Col. Suneel Bartwal, said on Tuesday.

Twelve to 14 terrorists were estimated to be in the Doda area, split into three groups, defence sources

ed in the Kathua area, he added.

There has been a distinct shift in terrorist violence to the south of the Pir Panjal in recent months, reminiscent of the early 2000s when this area was a hotbed of terrorism. Since May this year, 13 members of the security forces have been killed in the area, including nine Army personnel, and one person each from the Air Force, Border Security Force, Central Reserve Police Force, and the JKP.

Since November 2021, over 30 Army personnel have been killed in terror incidents in the area, while over 40 terrorists have been neutralised.

Defence sources said one of the major reasons for the high casualty rate was the lack of credible ground intelligence in the Jammu region south of the Pir Panjal.

**Lack of security forces**  
This is also exacerbated by the reduced number of security forces in the area in recent years. However, sources said that some additional troops have been brought in recently. Another challenge is the improved Chinese-made communication equipment being used by the terrorists, which has made interception difficult.

Hinting at Pakistan's continued involvement in promoting terror in the State, Lt. Col. Bartwal said the analysis of a large quantity of warlike stores recovered from the dead terrorists reveals the hand of "mimical agencies" from across the border.

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## The Hindu Analysis: 17

### 1. Is Terrorism shifting to Jammu Region?

(Doda Terrorist Encounter)

### 2. Juvenile Justice

### 3. LUCA: Last Universal Common Ancestor

## Doda Terrorist Encounter

### 4 soldiers, policeman killed in Doda encounter

The counter-terrorist operation in Jammu was continuing when last reports came in: Defence Minister Rajnath Singh speaks to Army chief. 12 to 14 terrorists are estimated to be in the area; Army has been conducting operations with the police to eliminate foreign terrorists who have infiltrated into Udhampur, Doda, Kishtwar and Bhandarwah areas

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"The Minister was apprised of the ground situation and the ongoing counter-terrorist operation in Doda by the Army chief," Mr. Singh's office said in a post on X. "Indian Army stands firm with the bereaved families in this hour of grief," the Army said in its own post.

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**Be on alert:** Army jawans stand guard at Lal Draman in Doda district near the site of a gun battle, on Tuesday. SPECIAL ARRANGEMENT

said. Based on intelligence inputs, the Army and Jammu & Kashmir Police launched a joint operation in the Urabaggi area, about 10 km north of Doda.

"At about [8:40 p.m.] on July 15, the search party was able to establish con-

tact with the terrorists hiding in the area, which is a thickly forested and mountainous area with restricted visibility due to low clouds and rain," Lt. Col. Bartwal said.

The four Army personnel were injured in the initial volley of fire, and later

succumbed to their injuries, he said.

Additional troops and equipment, including drones and other technical resources, were being used to flush out the terrorists.

Similar operations were being relentlessly conduct-

ed in the Kathua area, he added.

There has been a distinct shift in terrorist violence to the south of the Pir Panjal in recent months, reminiscent of the early 2000s when this area was a hotbed of terrorism.

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#### Lack of security forces

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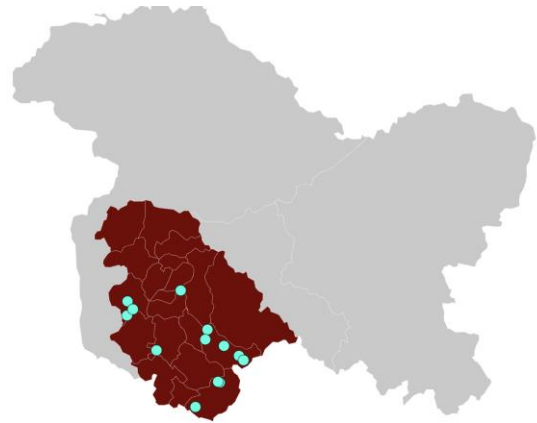
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## Doda Terrorist Encounter

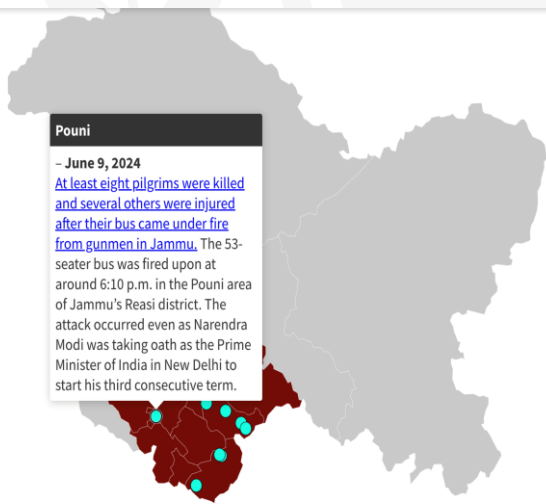
- On Monday, **four Army personnel and a J&K police official** were killed by unidentified terrorists in the **Desa forest area in Doda district of Jammu**.
- In the past three years, Jammu and Kashmir has witnessed the killing of 119 security forces personnel, and **over 40% of these killings were reported from the Jammu division**.



Source: News reports • Locations are approximate. Map is not to scale.

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## Recent encounters reported in Jammu



Source: News reports • Locations are approximate. Map is not to scale.

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## Is a new pattern emerging?

- From 2021, many security personnel have been killed in various incidents initiated by terrorists in **Poonch, Rajouri, Kathua, Reasi, Doda, and Udhampur** districts, a deviation from the past three years, when the Kashmir Valley was the epicentre of such incidents.
- Compared with **five terrorist incidents** and two security personnel killed in the Valley this year, **Jammu has seen six such attacks** in which 12 security personnel were killed.
- The Jammu region was a hotbed of militancy in the late 1990s and the early 2000s.

## What could be the possible reasons?

1. **Lack of credible ground intelligence** in Jammu Region
2. **Reduced number of security forces, making the area vulnerable:** After the 2020 Galwan clashes in eastern Ladakh, a large contingent of the Army was pulled out of Jammu and deployed along the China border.
3. **Improved Chinese made communication instruments** being used by foreign terrorists which has made interruption difficult.
4. Post-reading down of Article 370 in J&K in August 2019, and based on indicators such as zero stone-throwing events, no strikes, and a boom in tourism, the government has claimed huge success in the Kashmir Valley in terms of the overall security scenario. **“Reviving terrorism in Jammu upsets this narrative”**. The demography of the area is such that the attacks could flare up communal tensions too, leading to social unrest.

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## Pir Panjal Range

**Note:** The Bharatiya Nyaya Sanhita (BNS) adds terrorism as an offence. **It is defined as an act that intends to threaten the unity, integrity, and security of the country, intimidate the general public or disturb public order.**



## Juvenile Justice

### Trying juveniles as adults is not the answer

In May, a speeding car, allegedly driven by a teenager, killed two young techies in Pune. As prescribed by the Juvenile Justice (Care and Protection of Children) Act, or the JJ Act, 2015, the adolescent was initially brought before the Juvenile Justice Board (JJB), which granted him bail under seemingly lenient conditions. This decision, coupled with the tragic outcome of the incident and emerging accusations of privilege being used to tamper with the investigation, sparked public outrage. Following the backlash, the JJB modified its order, directing the adolescent's detention in an Observation Home. This was challenged before the Bombay High Court, which directed his release on the ground that he was granted bail in accordance with due procedure.

The High Court noted that the JJ Act is "not only a beneficial legislation, but is also a remedial one". The push by some to prosecute the adolescent as an adult raises broader questions about the power of the juvenile justice system to address severe offences like drunken driving and the demand for accountability in cases involving young offenders.

**Being tried as an adult**  
The JJ Act allows for the possibility of trying adolescents above 16 as adults if they are accused of committing a "heinous" offence. A "heinous" offence is one with a minimum punishment of seven years or more. Offences such as culpable homicide and causing death by negligence, which are common in drunken driving cases, are not "heinous" offences because they do not have a prescribed minimum punishment. The JJ Act, amended in 2021, now categorises an offence that has no minimum sentence but has a maximum sentence of more than seven years as a "serious offence" which, nonetheless, does not merit the transfer of a case to the adult criminal justice system. In any case, when an adolescent above 16 years of age is



**Anindita Pattanayak**  
a legal researcher at Enfold Proactive Health Trust

accused of a "heinous" offence, the JJB, a quasi-judicial body, conducts a preliminary assessment to determine if they should be tried as an adult. If it concludes that there is such a need, the adolescent is transferred to a sessions court, which independently assesses the suitability of trying the adolescent as an adult.

These protections are based on the understanding that adolescence is a temporary developmental stage characterised by immature judgement and underdeveloped impulse control. This is recognised by the Supreme Court in *Dr. Subramanian Swamy v. Raju* (2014) and by the UN Committee on the Rights of the Child. Consequently, the juvenile justice system emphasises rehabilitation and social reintegration over punishment, acknowledging that adolescents, due to their high neuroplasticity, are more receptive to change.

**Seeking accountability**  
Nonetheless, the juvenile justice system is rooted in holding offenders accountable for their actions. When an adolescent is found to have committed a crime, the JJ Act empowers the multidisciplinary JJB to tailor a response befitting the circumstances and the adolescent concerned. A conviction can result in institutionalisation of the offender, but with the express goal of rehabilitation. The JJBs can prescribe interventions such as therapy, psychiatric support, and de-addiction during and after institutionalisation. An individual care plan is prepared for the adolescent's rehabilitation keeping in mind their socioeconomic conditions and the circumstances of the crime. This approach has the potential to foster accountability and healing, creating opportunities for justice that are often unattainable within the rigid confines of the punitive adult justice system.

Specifically in cases of deaths caused by motor accidents, innovative approaches have been

attempted in Indonesia and the US, that enable offenders to face their victims and focus on personal accountability. In some jurisdictions, convicted drunk drivers are required to face a victim impact panel (VIP) of relatives of victims who express how the incident affected their lives. A report released in 2022 by Kevin Thompson and Sarah Joyce found a reduction in recidivism amongst offenders exposed to VIPs in North Dakota. While this can never change the life-altering incident itself, it personalises the loss and grief experienced by the victim and gives an opportunity to the offender to express regret.

Practices like this recognise the victim and their family as central to the process of justice dispensation in contrast to the traditional penal system where the victim is reduced to a witness or is not involved at all as the state takes over prosecution. They create space for the needs of the victims that may range from compensation to an apology or explanation or acknowledgement of responsibility by the offender. They also expose adolescents to an education regarding accountability and sensitivity to fellow human beings to foster their transformation into responsible adults. Facing the victims or their families can be a powerful and transformative experience for offenders. Responses of the juvenile justice system can include the family members and communities of both the offender and the victim and can involve counselling the offender's family. This approach recognises that crime is often the outcome of a complex interplay of societal and psychological factors.

However, the potential of the juvenile justice system remains unfulfilled. Trying adolescents as adults sidesteps the problem of weak implementation of the juvenile justice system. The issue lies not in the perceived leniency or "mistake" of the system, but rather in the failure to fully implement its foundational principles.

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## Juvenile Justice

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## Juvenile Justice (Care and Protection of Children) Act, 2015

- **Juvenile Justice (Care and Protection of Children) Act, 2015**

The Act provides for a separate system of juvenile justice that is different from the adult criminal justice system. This means that children in conflict with the law are not treated as criminals. They are treated as children who need care and protection

- It was enacted in 2015 and replaced the previous Juvenile Justice Act, 1986.
- The Act defines a child or Juvenile as a person who is below the age of 18 years.
- Gives definitions for **petty (maximum of 3 years imprisonment), serious (3 to 7 years) and heinous crimes (7 years imprisonment)** by children.
- **Minors in the age group 16 – 18 years to be treated as adults in the case of heinous crimes.**
- For this, the Juvenile Justice Board would assess the child's physical and mental capacities, his/her ability to comprehend the consequences of the crime, etc. and determine whether the child can be treated as an adult.

Note: Any child below the age of 7 cannot be convicted under any law for any crime

## Juvenile Justice (Care and Protection of Children) Act, 2015

- **Child Welfare Committee, Juvenile Justice Board and Special Observation Home:**
  - **Child Welfare Committees** for producing of children before JJB within 24 hours of apprehension.
  - **Juvenile Justice Boards.** This focuses on speedy trial and individual care and rehabilitation of juvenile offenders. **Juvenile Justice Board** acts as a separate court for juveniles, comprises a **judicial magistrate of the first class and two social workers, one of whom at least should be a woman.**
  - **Special Homes for rehabilitation of juvenile offenders**

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# LUCA: Last Universal Common Ancestor

- The origin of life on earth is one of the world's most enduring mysteries.
- Scientists widely believe a combination of geological, climatic, and chemical processes gave rise to the building blocks of life.

## Glimpses of **LUCA**, the life-form from which all other life descended

As mysteries go, a close second to the origin of life is how life-forms started to evolve. Researchers believe bacteria, archaea, and eukarya all originated from the last universal common ancestor. There is no fossil evidence of its existence, but the fact that modern genomes share so many features provides some clues

Sridhar Sivasubbu  
Yinod Scaria

**T**he origin of life on earth is one of the world's most enduring mysteries. There are a number of competing theories, but all of them lack conclusive proof. Nonetheless, scientists widely believe a combination of geological, climatic, and chemical processes gave rise to the building blocks of life.

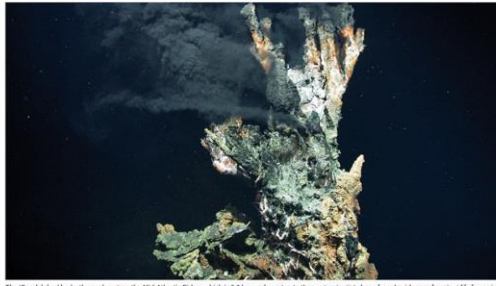
In the 1920s, Alexander Oparin and J. B. S. Haldane independently proposed their origin theories – the first of their kind. In 1952 and 1953, Oparin and Haldane, respectively, suggested the first molecules making up the earliest life forms gradually self-organised from a "primordial soup" in a young earth's temperature-rich environment. This idea is today called the Oparin-Haldane hypothesis.

Researchers have also conducted biochemical experiments and found evidence to support this hypothesis. A particularly famous one was the Miller-Urey experiment in 1952, in which University of Chicago researchers Stanley Miller and Harold Urey showed that in the right conditions, inorganic compounds could give rise to **complex organic compounds**. Miller and Urey mixed methane, ammonia, and water, and when they applied a strong electric current – like a lightning strike might have – the mixture contained amino acids, the building blocks of proteins. They reported their discovery the very next year in the journal *Science*.

While we have evidence today that the earth's environment then may not have been much like what the experiment presumed to mimic, the very fact that amino acids could be created in a breath of inorganic molecules was groundbreaking.

Other researchers have proposed other theories about the origin of life. A particularly prominent one is that **metabolites from space** could have brought the building blocks of life, as validated by discoveries on the earth as well as out there. In August 2019, French and Italian scientists reported discovering extra-terrestrial organic material 3.3 billion years old, whereas Japan's Hayabusa 2 mission to the asteroid Ryugu indicated the presence of more than 20 amino acids there.

**LUCA and the molecular clock**  
As mysteries go, a close second to the origin of life is how life-forms evolved to produce the rich diversity we see around us today. Researchers believe all three branches of life – bacteria, archaea, and eukarya – originated from a single cell, called the **last universal common ancestor**



The 'Candidatus' hydrothermal vent on the Mid-Atlantic Ridge, which is 3.3 km underwater. In the past, scientists have found evidence of ancient life forms in the precipitates around such vents. <https://doi.org/10.1016/j.cub.2019.07.016>

**(LUCA)** There is no fossil evidence to support the existence of LUCA, but the fact that modern genomes share so many features provides some insights. An important concept that allows scientists to reconstruct the 'tree of life' is the theory of the molecular clock. Molecular biologist Emile Zuckerkandl and biochemist Linus Pauling proposed it in the 1960s, and biologist Motoo Kimura subsequently improved it.

According to a simplified version of the theory, the rate at which mutations are added or removed from a population's genome is proportional to the rate of acquiring new mutations, which is constant. Later studies also found that the mutation rate varies between species. Using these two facts, researchers developed a way to estimate how much time could have passed between two evolutionary events.

To calibrate the **molecular clock** to a particular rate of mutations, researchers established links between a genome and known events, such as the 'year' on which the first mammal evolved or the age of certain fossils. These links act like temporal benchmarks.

Thanks to the large number of genome sequences and fossils of various organisms, as well as the computing power available today, researchers routinely use the molecular clock to understand the evolution of various

**Scientists widely believe a combination of geological, climatic, and chemical processes gave rise to the building blocks of life.**

life-forms on earth through time.

**Which is older: LUCA or fossils?**  
In a recent paper in the journal *Nature Ecology and Evolution*, researchers at the University of Bristol and Exeter in the U.K. constructed a phylogenetic tree of 350 bacterial and 350 archaeal genomes. Then, using a molecular clock, the team estimated when LUCA could have originated: around 4.2 billion years ago, just 300 million years after the earth itself formed.

The team also reported that LUCA may have had a small genome, of some 2.5 million bases and encoding around 2,600 proteins, all just enough to help it survive in a unique environmental niche. The team also suggested the metabolites produced by LUCA – compounds produced as a result of its metabolism – could have created a 'secondary' ecosystem in which other microbes could have emerged.

Importantly, the origin of LUCA by 4.2 billion years significantly predates

previous suggestions about the origin of life on earth. For context, researchers have found fossil records of the earliest life-forms in the Proterozoic in western Australia, one of the few places on the planet where archaic rocks are exposed aboveground and accessible. Studies of these fossils have suggested that life that lived on the rocks emerged around 2.4 billion years ago. The current study, on the other hand, pushes this date back by almost a billion years, almost on the heels of the birth of our planet itself.

The researchers also found some reasons to believe LUCA may have had genes responsible for immunity, suggesting it had to fight off viruses.

Taken together, the findings are tremendously significant, not just for understanding how life emerged and evolved on the earth; they also speak to our ability to look for similar forms of life across the universe. The insights into evolution they provide will also give a significant filip to human ambitions to engineer synthetic organisms for various industrial, chemical, and biological processes on the earth, as well as to create or moderate ecosystems on other planets in the future.

*(The authors are senior consultants at Vishwanath Cancer Care Foundation, and adjunct professors at IIT Kanpur and Dr. D.Y. Patil Vidyapeeth, and distinguished visitors at Ashoka University.)*

### THE GIST

In 1952, researchers applied a strong electric current to a mixture of methane, ammonia, and water. This reaction formed amino acids, the building blocks of proteins.

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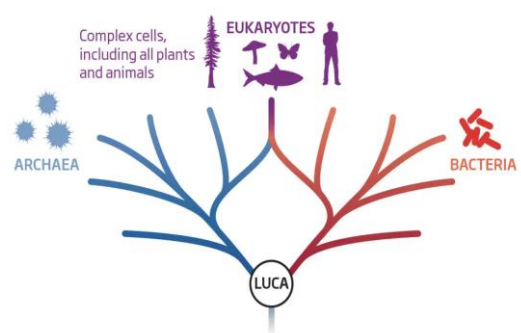
Researchers recently constructed a phylogenetic tree of 350 bacterial and 350 archaeal genomes. Then, using a molecular clock, they estimated that LUCA possibly originated around 4.2 billion years ago, 300 million years after the earth formed.

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# LUCA: Last Universal Common Ancestor

## LUCA:

- Researchers believe all life originated from a single cell, called the last universal common ancestor (LUCA).
- Using a molecular clock, the team estimated when LUCA could have originated: around **4.2 billion years ago**, just 300 million years after the earth itself formed.
- Scientists suggested the LUCA — could have **created a 'secondary' ecosystem** in which other microbes could have emerged.
- The researchers also found some reasons to believe **LUCA may have had genes responsible for immunity**, suggesting it had to fight off viruses.



## Molecular clock

- An important concept that allows scientists to reconstruct the 'tree of life' is the theory of the molecular clock.
- The molecular clock is a term for a **technique that uses the mutation rate of biomolecules to deduce the time in prehistory when two or more life forms diverged.**

