Mains Practice Question

Q. Explain the concept of geomagnetism. Discuss the impact of the recent shift in the Earth’s magnetic north pole. (250 words)

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Approach

- Define geomagnetism and mention the recent shift in Earth’s magnetic North pole.
- Discuss the impacts of this shift.

Introduction

- Geomagnetism is the study of the dynamics of the Earth’s magnetic field, which is produced in the outer core.
- The Earth’s magnetic field is predominantly a geo-axial dipole, with north and south magnetic poles located near the geographic poles.
- Earth’s magnetic field is known to have wandered and flipped in the geologic past. This wandering has generally been quite slow, around 9 km a year, allowing scientists to easily keep track of its position. But since the turn of the century, this speed has increased to 50 km a year.
- Recently, Earth’s magnetic North Pole has drifted so fast that the World Magnetic Model (a large spatial-scale representation of the Earth's magnetic field) have had to officially redefine the location of the magnetic North Pole much earlier than expected.
- Earth’s magnetic North Pole is quickly moving from the Canadian Arctic towards Russia.

Possible Impacts of Shifting Earth’s Magnetic North Pole

The Earth’s magnetic field (or geomagnetic field) is an ever-changing phenomenon and these changes can affect health and safety, and economic well-being in a myriad of ways:

- The shifting geomagnetic field, along with its associated phenomena can both assist and hamper navigation and surveying techniques.
- It can impede geophysical exploration; can disrupt electric power utilities, and pipeline operations; and can also influence the functioning of modern communication systems, spacecraft etc.
- Shifting pole can also affect the power of Earth's magnetic field to deflect harmful solar radiation and cosmic rays from entering Earth’s atmosphere.
- The Earth's magnetic field is also responsible for creating the northern and southern lights – spectacular events that are only visible near the magnetic poles. Thus the present location of these lights might be changed with the shifting of Earth’s magnetic North pole.
- Animals that use the Earth’s magnetic field for navigation—including birds, salmon, and sea turtles—could get lost during their routine journeys.

Conclusion

The shift in Earth's magnetic field is a minor change for most of us -noticeable only to people who are attempting to navigate very precisely and very close to the Arctic. But the north magnetic pole's inexorable drift suggests that something strange and potentially powerful is taking place deep within the

Earth.