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UPSC Mains 2016 Anthropology Paper 1

Year-wise PYQ pack · WRAP model answers with canonical links

Official UPSC stems in exam order. Each live answer sits on one WRAP URL; this PDF is the year pack, not a second copy of the article. Open the link under a question for the full page.

<https://wrapexams.com/upsc/mains/anthropology/gs-1/2016/>

Q1(a) · 10 marks

Differences between Social Anthropology and Sociology.

Anthropology GS 1 · 2016 · The Nature of Society

Revision summary

Social anthropology grew from intensive fieldwork in small-scale societies.

Sociology grew from industrial class, state, and survey.

Malinowski versus **Durkheim** is the textbook origin split.

Srinivas and B  teille show the Indian overlap.

The wall is departmental, not a law of nature.

Introduction

Social anthropology and sociology both study social relations. They grew from different field habits, scales, and colonial histories.

Body

The usual contrasts

- **Social anthropology**, after **Malinowski** and **Radcliffe-Brown**, specialised in small-scale, kinship-heavy societies and long **fieldwork**.
- **Sociology**, after **Durkheim**, **Weber**, and **Marx**, specialised in industrial classes, the state, and surveys of large populations.
- **Method**: participant observation versus questionnaire and official statistics, as a crude teaching split.

Why the wall is thin

- **M. N. Srinivas** brought village India into both rooms. **B  teille** wrote as sociologist with anthropological closeness.
- Urban ethnography and multi-sited work erased the 'primitive versus modern' division.
- In Britain the names marked departments. In India the same village can sit on either syllabus.

Flow diagram

Social anthropology -> Long fieldwork kinship

Sociology -> State class survey

Village India -> Social anthropology

Village India -> Sociology

Conclusion

The difference is historical method and scale, not two species of fact. Anthropology's mark remains intensive fieldwork; sociology's mark remains the large institutional set.

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WRAP Exams

Q1(b) · 10 marks

Cultural Relativism

Anthropology GS 1 · 2016 · The Nature of Culture

Revision summary

Relativism asks that custom be read in its own history.

Boas used it against unilinear racial stages.

Herskovits and Benedict spread it as method and public teaching.

It is a brake on ethnocentrism, not a moral blank cheque.

Rights debates mark its political edge.

Introduction

Cultural relativism says a custom must be understood in its own cultural frame before it is ranked. It was Boas's answer to ethnocentric ladders.

Body

The claim

- **Franz Boas** and **Herskovits** taught that values are historically local. Potlatch or caste purity is not a failed Europe.
- **Method:** hold judgment while the ethnography is built. **Benedict's** Patterns of Culture popularised the stance.

Limits

- Relativism is a research ethic, not a ban on criticising violence.
- **Universalists** in human rights, and **Sahlins** versus **Obeyesekere** on Captain Cook, show the fight over how far local meaning goes.
- Female genital cutting and untouchability are understood locally and still judged in law and policy.

Flow diagram

Cultural relativism -> Boas Herskovits

Cultural relativism -> Understand in context

Cultural relativism -> Not a ban on judgment

Conclusion

Cultural relativism blocks racial ranking of whole peoples. It does not make every practice beyond critique once the local meaning is known.

Open WRAP page —

<https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/cultural-relativism-2016/>

Q1(c) · 10 marks

Lineage and Clan

Anthropology GS 1 · 2016 · Kinship

Revision summary

Lineage members can show genealogical links to an ancestor.

Clan members share a putative ancestor and often a totem.

Lineages nest inside clans in many segmentary systems.

Nuer feud and fusion made the distinction famous.

Both groups are commonly exogamous.

Introduction

Lineage and clan are descent groups. They differ by whether members can trace the actual links to an ancestor.

Body

Lineage

- A **lineage** is a unilineal group of people who demonstrate descent from a known ancestor.
- **Evans-Pritchard's** Nuer **minimal** and **maximal** lineages segment in feud and fusion.
- Property, blood compensation, and worship often sit on the lineage.

Clan

- A **clan** is a unilineal group that only stipulates a common ancestor, often totemic or mythical.
- Several lineages nest inside a clan, as among many Indian Scheduled Tribes and Scottish usage in textbooks.
- **Fortes** on Tallensi and **Middleton and Tait** on segmentary systems used this nesting.

Teaching contrast

- **Lineage:** demonstrated. Clan: putative. Both may be exogamous.

Flow diagram

Unilineal descent -> Lineage demonstrated

Unilineal descent -> Clan stipulated

Lineage demonstrated -> Nuer segments

Clan stipulated -> Totem ancestor

Conclusion

A lineage proves the pedigree. A clan claims a distant ancestor. Nuer segmentation is the type case for how the two nest in politics.

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Q1(d) · 10 marks

Totemism

Anthropology GS 1 · 2016 · Religion

Revision summary

A totem is an emblem or kin-like species for a group.

Durkheim read it as the clan worshipping itself.

Lévi-Strauss read it as a system of differences.

Taboo and exogamy often travel with the emblem.

Indian tribal clans use totems as identity, not as science of animals.

Introduction

Totemism links a human group to a plant, animal, or object as emblem, kin, or ritual partner. It is a classic of religion and classification.

Body

Readings

- **Durkheim** treated the Australian totem as the clan's flag; worship is society made sacred.
- **Frazer** gathered taboos and descent from the totem species.
- **Radcliffe-Brown** stressed ritual attitudes to nature. **Malinowski** tied some totems to food and anxiety.
- **Lévi-Strauss** in Totemism said species are good to think: totems classify groups, they are not a failed zoology.

Indian notes

- Clan totems appear among many tribes. The point is social identity and marriage rule, not a zoo.

Flow diagram

Totemism -> Durkheim clan sacred

Totemism -> Levi-Strauss classify

Totemism -> Exogamy identity

Conclusion

Totemism is a relation between group and natural emblem. **Durkheim** saw society; Lévi-Strauss saw a logic of difference. Both remain teaching tools.

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Q1(e) · 10 marks

Functionalism.

Anthropology GS 1 · 2016 · Functionalism (Malinowski)

Revision summary

Functionalism asks what a custom does in the present.

Malinowski tied culture to individual needs.

Radcliffe-Brown tied institutions to structural continuity.

It justified intensive fieldwork against unilinear history.

Limits are harmony bias and a thin sense of time.

Introduction

Functionalism explains a custom by the present job it does for persons or for the social whole. It was the British school's answer to speculative history.

Body

Two wings

- **Malinowski's** biological functionalism: culture meets seven needs, from metabolism to growth, as in Trobriand gardens and kula.
- **Radcliffe-Brown's** structural functionalism: institutions maintain social structure, as Andaman rites keep solidarity.

Yield and limit

- **Fieldwork replaced armchair stages. Every rite was asked:** what does it do now?
- **Evans-Pritchard** later said the Nuer need history, not only function.
- Conflict, inequality, and change look like noise if function is only harmony. **Gluckman** put conflict inside function.

Flow diagram

Functionalism -> Malinowski needs

Functionalism -> Radcliffe-Brown structure

Functionalism -> History conflict

Conclusion

Functionalism made ethnography a study of living uses. Malinowski served needs; Radcliffe-Brown served structure. History and conflict must still be let back in.

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Q2(a) · 20 marks

Delineate the salient features of Chalcolithic cultures.

Anthropology GS 1 · 2016 · Chalcolithic

Revision summary

Chalcolithic means copper with a continuing stone kit.

Indian cases are rural farmers, not Harappan cities.

Painted pottery and mud houses are typical.

Ahar, Malwa, Jorwe, and OCP are the main regional labels.

Sankalia's Deccan work made Inamgaon a teaching village.

Introduction

Chalcolithic, or Copper-Stone Age, cultures use copper with a still-strong stone toolkit. In India they are village farming cultures after the Neolithic and beside or after Harappa in many regions.

Body

Salient features

- **Mixed metal and stone:** thin copper axes, fish-hooks, and ornaments; plentiful microliths and ground stone.
- **Rural farming:** wheat, barley, rice, pulses, and stock (cattle, sheep, goat) in regional mixes.
- **Mud and wattle houses**, sometimes planned, with hearths and storage pits. Burials may be urns or pits inside or near the house.
- **Painted pottery** is a fossil director: black-on-red, white-painted, and ochre-coloured wares in different provinces.
- **Craft specialisation is modest:** bead-making, copper smelting on a small scale, not Harappan urban workshops.
- **Chiefly or lineage villages**, not full cities. Contacts with Harappan and later Iron Age groups vary by zone.

Indian geography of the type

- **Ahar-Banas** in Mewar: copper, black-and-red ware.
- **Kayatha** and **Malwa** in central India; **Jorwe** at **Inamgaon** and **Daimabad** in Maharashtra.
- **Ochre Coloured Pottery** and copper hoards in the Ganga-Yamuna doab.
- **Ganeshwar-Jodhpura** copper, **Anarta** in Gujarat, and eastern sites such as **Pandurajar Dhibi** show the same grade.
- **Sankalia**, **Dhavalikar**, and **Misra** made these sequences teachable.

What it is not

- **It is not a single pan-Indian people. It is a technological and settlement grade:** farm village plus copper.

Flow diagram

Chalcolithic -> Copper plus stone

Chalcolithic -> Farm village

Chalcolithic -> Painted pottery

Farm village -> Ahar Malwa Jorwe

Conclusion

Chalcolithic cultures are farming villages that add copper to stone. Painted wares, mixed farming, and regional names from Ahar to Jorwe are the Indian salient features.

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Q2(b) · 15 marks

Discuss the impact of urbanization and feminist movements on family in India.

Anthropology GS 1 · 2016 · Family

Revision summary

Urban jobs push neolocal residence while property often stays joint.

- **Shah's point:** jointness can survive split houses.

Feminist movements targeted dowry, succession, and domestic violence.

Laws changed the script faster than everyday kinship.

The result is negotiated families, not one modern nuclear standard.

Introduction

Urban work and feminist politics have both pressed the Indian family. The joint household did not vanish, but authority, marriage, and care were renegotiated.

Body

Urbanization

- Jobs, migration, and rented rooms favour **neolocal** nuclear units, as **Gore**, **Kapadia**, and later urban ethnography recorded.
- Remittances still feed a rural joint estate. **Shah** argued the joint family persists as property and ritual even when residence splits.
- **Caste endogamy and arranged marriage adapt:** matrimonial ads, not a free love market for all classes.
- Care of the old and the child becomes a crisis when women also work for wages.

Feminist movements

- From **nineteenth-century** social reform to **1970s** campaigns, feminists named dowry death, domestic violence, and the Hindu Undivided Family as political.
- **Law: Hindu Succession** amendments, **PNDT**, and **domestic violence** statutes shift, slowly, who owns and who may leave.
- **Shah Bano** and later debates showed that gender justice and community law can collide.
- Women as earners claim voice in the house; the double shift of office and kitchen is the unfinished impact.

Together

- The city supplies the wage. Feminism names the inequality inside the household. Neither produced a single new family type.

Flow diagram

Urbanization -> Neolocal wage

Feminism -> Law property violence

Urbanization -> Indian family

Feminism -> Indian family

Conclusion

Urbanization splits residence more than it kills kin. Feminist movements politicised dowry, property, and violence. Indian family change is both demographic and legal.

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WRAP Exams

Q2(c) · 15 marks

According to Geertz, how does the cock-fight reveal aspects of Balinese culture?

Anthropology GS 1 · 2016 · Symbolic and interpretive theories (Turner, Schneider and Geertz)

Revision summary

Geertz treats the Balinese cockfight as a readable public text.

Cocks stand for men; deep bets stand for honour, not utility.

Betting partnerships map kinship and rank.

The bout is a commentary on status that ordinary talk hides.

Thick description is the method that shows this.

Introduction

- **In Deep Play:** Notes on the Balinese Cockfight, Clifford Geertz reads the fight as a public text. Balinese men stake status, not only cash, on the birds.

Body

The event as text

- The cock is a male metaphor. Care, spurs, and the ring are a story about men, not a rural hobby only.
- **Deep play**, from **Bentham**, is a bet too large for utility. Men still bet because honour is on the line.
- **Wagers map** alliances: kin and status partners back the same bird. The village reads who stands with whom.

What is revealed

- **Status hierarchy** is performed and temporarily risked. A man cannot not care once his cock is in.
- Violence is displaced onto animals; the culture can show aggression without ordinary street feud.
- After the bout, everyday etiquette returns. The fight is a **meta-social commentary**, Geertz's phrase for culture reflecting on itself.
- Thick description of the wink-like detail-who bets, how much, which kin-makes the meaning visible.

Limit

- Critics say Geertz underplays women, the state ban, and material interest. The essay still trains interpretive method.

Flow diagram

Cockfight -> Status honour
Cockfight -> Kin betting alliances
Cockfight -> Public text thick description

Conclusion

For Geertz the cockfight is Balinese status, kinship alliance, and male selfhood written in blood and bets. It is culture reading itself, not a pointless gamble.

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WRAP Exams

Q3(a) · 20 marks

Describe the cardinal points of descent and alliance theories.

Anthropology GS 1 · 2016 · Kinship

Revision summary

Descent theory centres unilineal groups, property, and segmentation.

Fortes and Evans-Pritchard are the African type authors.

Alliance theory centres the incest rule and spouse exchange.

Lévi-Strauss and Dumont are the type authors.

North Indian gotra and south Indian cross-cousin rules show both logics.

Introduction

Descent theory and alliance theory are two ways to read kinship. One starts from the group that recruits children. The other starts from the marriage that binds groups.

Body

Descent theory

- **Maine, Morgan**, then **Fortes** and **Evans-Pritchard** made unilineal descent the political skeleton.
- **Cardinal points: filiation, jural authority, corporate property, and segmentary opposition.**
- The **lineage** owns land and blood-debt. The mother's brother may be affective, as Fortes split the domestic from the politico-jural.
- African models-Nuer, Tallensi, Tiv-were the type. The person is a member first, a spouse second.

Alliance theory

- **Lévi-Strauss** in *The Elementary Structures of Kinship* made **incest taboo** and **exchange of women** the start of society.
- **Cardinal points: positive marriage rules, cross-cousin** prescriptions, **restricted** versus **generalised** exchange, and **alliance** as a structure of repeating affinal ties.
- **Dumont** applied this to south Indian Dravidian kinship: affines are a category, not a failure of descent.
- **Leach** on Kachin showed that mayu-dama alliance can rank groups.

Cardinal contrast

- **Descent asks:** who is the heir? Alliance asks: who is the repeating affine?
- **Needham** and later critics said both can over-systematise practice.
- **Indian ethnography needs both:** north Indian gotra exogamy (descent-like) and south Indian cross-cousin preference (alliance-like).

Flow diagram

Kinship -> Descent lineage jural

Kinship -> Alliance exchange marriage

Descent lineage jural -> Nuer Fortes

Alliance exchange marriage -> Levi-Strauss Dumont

Conclusion

Descent theory's cardinal points are lineage, filiation, and jural corporation. Alliance theory's are incest, prescribed marriage, and repeating exchange. Kinship in the field often runs both engines.

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Q3(b) · 15 marks

Discuss different social control mechanisms in simple societies.

Anthropology GS 1 · 2016 · Political Organization and Social Control

Revision summary

Control without police uses gossip, ridicule, and witchcraft accusation.

Feud and compensation handle homicide, as among the Nuer.

Taboo, oath, and ordeal are ritual courts.

Big-men and age-sets organise following and discipline.

Simple names scale, not the absence of order.

Introduction

Simple societies often lack a police and a written code. They still control behaviour through kin, ritual, talk, and force that is socially named.

Body

Informal and jural

- **Ridicule**, gossip, and **witchcraft** accusation, as **Evans-Pritchard** showed among Azande, police the envious and the rude.
- **Kin avoidance** and respect rules, as in Indian tribal in-law taboos, prevent daily friction.
- **Blood feud** and **leopard-skin** peacemaking among Nuer turn homicide into a payable account.

Ritual and belief

- **Taboo** and oath bind the person. **Ordeal** and oracle decide guilt where evidence is thin.
- **Initiation** installs the law in the body. Elders' curses matter where the state does not.

Political

- **Big-man** generosity, as **Sahlins** described in Melanesia, buys following without a crown.
- **Age-sets** among Maasai-type systems discipline youth.
- **Gluckman's** peace in the feud: conflict is channelled, not absent.

Limit of the word simple

- These mechanisms are complex. 'Simple' means scale and lack of specialised courts, not lack of law.

Flow diagram

Social control -> Gossip witchcraft

Social control -> Feud compensation

Social control -> Taboo ordeal

Social control -> Big-man elders

Conclusion

Social control in small-scale societies runs on gossip, witchcraft belief, feud-and-peace, ritual taboo, and big-man or elder authority. It is law without a police file.

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WRAP Exams

Q3(c) · 15 marks

Critically examine different Anthropological approaches to Religion.

Anthropology GS 1 · 2016 · Religion

Revision summary

Tylor and Frazer treated religion as explanation and stage.

Malinowski tied magic to practical anxiety.

Durkheim and Radcliffe-Brown tied rite to the group.

Geertz and Turner stress meaning and symbol.

Asad warns that 'religion' is not a neutral universal box.

Introduction

Anthropology has treated religion as error, as social glue, as meaning, and as power. Each approach catches one face of ritual and belief.

Body

Intellectualist and evolutionary

- **Tylor's** animism and **Frazer's** magic-religion-science ladder treated belief as explanation. The limit is the armchair stage.

Emotional and psychological

- **Malinowski** tied Trobriand magic to anxiety at the reef. **Freud** read ritual as neurosis. Useful for motive; thin for public structure.

Sociological

- **Durkheim's** sacred and church, **Radcliffe-Brown's** rites of solidarity, and **Marxist** opium-and-ideology readings stress group and class.
- **Limit:** belief becomes only social cement or only veil.

Symbolic and interpretive

- **Turner's** Ndembu symbols and **Geertz's** religion as a cultural system of moods and motivations.
- **Lévi-Strauss** read myth as logic. Risk: the villager becomes a text.

Later critical

- **Asad** historicised 'religion' as a Christian-secular category. **Tambiah** and **Obeyesekere** brought practice and person back.
- Feminist and postcolonial work ask whose spirits and whose priesthood.

Flow diagram

Religion -> Tylor Frazer intellect
Religion -> Durkheim social
Religion -> Geertz Turner meaning
Religion -> Asad category critique

Conclusion

Approaches to religion run from Tylor's intellectualism through Durkheim's church to Geertz's meaning and Asad's critique of the category. Use them as a kit, not as one church of theory.

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WRAP Exams

Q4(a) · 20 marks

Discuss the principles governing production, distribution and exchange in simple societies.

Anthropology GS 1 · 2016 · Economic Organization

Revision summary

Production is household and lineage labour on common or clan land.

Distribution follows reciprocity and redistribution more than wage.

Exchange is gift, kula-like partnership, and spheres of goods.

Polanyi and Sahlins name the principles.

Price market is not the default law.

Introduction

In small-scale societies, production, distribution, and exchange are instituted in kinship and ritual. They are not a miniature stock market.

Body

Production

- Labour is largely **household** and **kin**, as **Sahlins**'s domestic mode of production stated.
- Land is often **lineage estate**, not a freehold commodity. Tools are simple; knowledge is seasonal.
- **Gender and age** divide tasks: Trobriand gardens, Nuer herding, !Kung foraging parties.
- Surplus is modest. **Boserup** still applies when fallow shortens.

Distribution

- **Polanyi's three principles: reciprocity, redistribution, and market.**
- **Redistribution sits on a chief or temple:** potlatch, Trobriand yam display, Indian jajmani as a debated case.
- Sharing of meat among foragers, as **Lee** and **Woodburn** described, levels luck.

Exchange

- **Reciprocity** after **Sahlins**: generalised, balanced, negative.
- **Malinowski's** kula and **Mauss's** gift: the thing carries a person and an obligation to return.
- **Bohannan's** spheres block conversion of all goods into one money.
- Barter and silent trade exist; they do not make the whole economy a price system.

Principle that governs

- **Embeddedness:** who you are to the other party decides the rate more than a posted price.

Flow diagram

Simple economy -> Kin household production

Simple economy -> Share redistribute

Simple economy -> Gift reciprocity spheres

Conclusion

Simple economies produce through kin labour, distribute by sharing and chiefly or ritual pooling, and exchange as gift, balanced reciprocity, or bounded spheres. Market price is a late, limited principle.

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WRAP Exams

Q4(b) · 15 marks

How do the concepts of binary opposites and exchange figure in Levi-Strauss' structural analysis of kinship?

Anthropology GS 1 · 2016 · Structuralism (Lévi-Strauss and E. Leach)

Revision summary

Binary opposites are the mind's contrasts, as in own/affine.

The incest taboo is the nature/culture cut.

Exchange of spouses builds the social whole.

Restricted and generalised exchange are the two machines.

Cross-cousin terms turn the binary into a marriage rule.

Introduction

Lévi-Strauss read kinship as a language of contrasts and as a system of exchange. Binary opposites are how the mind cuts the world; exchange is how groups are tied.

Body

Binary opposites

- **Structuralism, from Saussure and Jakobson, treats meaning as difference:** raw/cooked, nature/culture, own/affine.
- The **incest taboo** is the cut that makes culture. Women of one's group become 'sisters'; women of the other become spouses.
- **Kin terms work as oppositions:** parallel versus cross cousin is a binary that organises marriage.

Exchange

- Society begins when groups **give spouses**. The gift of women is the elementary social contract in his formula.
- **Restricted exchange** is two-sided swapping. **Generalised exchange** is a delayed circle, often with status.
- Cross-cousin marriage is the operator that turns opposition into repeating alliance.

How they join

- **Binary:** sister versus wife. Exchange: my sister's marriage makes me affine to another line.
- **The Elementary Structures of Kinship** is this algebra. Later **Needham** said ethnography is messier than the grid.

Flow diagram

Levi-Strauss -> Binary nature culture own affine

Levi-Strauss -> Spouse exchange

Binary nature culture own affine -> Incest cut

Spouse exchange -> Cross cousin alliance

Conclusion

For Lévi-Strauss, kinship thinks in binaries and binds groups by exchanging spouses. The incest cut and cross-cousin rule are the hinge between opposition and alliance.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/how-do-the-concepts-of-binary-opposites-and-exchange-figure-in-levi-strauss-structural-analysis-of-kinship/>

WRAP Exams

Q4(c) · 15 marks

Describe the evolution of Fieldwork tradition in Anthropology.

Anthropology GS 1 · 2016 · Fieldwork tradition in anthropology

Revision summary

Early anthropology used travellers, missions, and questionnaires.

Torres Strait and Boas professionalised field collecting.

Malinowski's Trobriand stay became the charter of immersion.

Indian village studies localised the tradition.

Reflexivity and multi-sited work are the late evolution.

Introduction

Fieldwork became anthropology's craft over a century. It moved from travellers' notes to a professional stay, then to reflexive and multi-sited work.

Body

Before the year in the village

- Missionaries, administrators, and **Morgan's** questionnaires gathered data at a distance.
- **Rivers** on the **Torres Strait** expedition (1898) brought genealogical method and a team survey.
- **Boas** on the Northwest Coast combined museum collecting with repeated visits.

The classical stay

- **Malinowski** in the Trobriands made **participant observation**, the native language, and the tent the charter.
- **Radcliffe-Brown** in the Andamans, **Mead** in Samoa, and **Evans-Pritchard** in Nuerland spread the model.
- **Srinivas** and the Indian village school brought the tradition home.

Later turns

- Team projects, **Chicago** urban work, and **Whyte's** Street Corner Society widened the 'tribe' field.
- **Writing Culture** made the stay a written, power-laden encounter. Women and indigenous anthropologists named the old male colonial gaze.
- **Marcus** multi-sited fieldwork follows people, things, and NGOs across borders.
- Ethics boards and long-term restudies, as in **Firth's** Tikopia returns, now mark the craft.

Flow diagram

Expedition Rivers Boas -> Malinowski immersion
 Malinowski immersion -> Village India Srinivas
 Village India Srinivas -> Reflexive multi-sited

Conclusion

The fieldwork tradition evolved from notes and expeditions to Malinowski's immersion, then to village India, cities, and multi-sited, reflexive research. The constant is presence among the people studied.

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WRAP Exams

Q5(a) · 10 marks

Rh-Blood Group

Anthropology GS 1 · 2016 · Age, sex and population variation as genetic marker

Revision summary

Rh groups centre on the D antigen.

Positive means D present; negative means D absent.

An Rh-negative mother can be sensitised by an Rh-positive fetus.

Anti-D prophylaxis prevents most haemolytic disease.

Frequencies differ by population, as a polymorphism.

Introduction

The Rh blood-group system is a set of red-cell antigens, of which D is the clinically decisive one. It matters in transfusion and in pregnancy.

Body

Genetics and types

- **Landsteiner and Wiener** named Rhesus after the monkey work; later mapping showed a human **RH** locus on chromosome 1.
- **Rh positive** means D is present. **Rh negative** means D is absent. C, c, E, e add further types.
- **Inheritance is Mendelian. Population frequencies vary:** Rh-negatives are commoner in some European groups than in many Indian samples.

Medical anthropology

- An Rh-negative mother and Rh-positive fetus can cause **haemolytic disease of the newborn** after sensitisation.
- **Anti-D immunoglobulin** prevents most cases. Transfusion must still match D.
- It is a polymorphism, not a racial essence.

Flow diagram

Rh system -> Antigen Antigen D

Antigen D -> Rh positive

Antigen D -> Rh negative HDN risk

Conclusion

Rh is a red-cell system led by antigen D. Its anthropological use is population frequency; its medical use is transfusion and HDN prevention.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/rh-blood-group/>

Q5(b) · 10 marks

Rhodesian Man

Anthropology GS 1 · 2016 · Rhodesian man.

Revision summary

Rhodesian Man is the 1921 Kabwe skull from Zambia.

Woodward named *Homo rhodesiensis*.

It is a heavy-browed archaic Homo of the Middle Pleistocene.

Many now file it with *heidelbergensis* or a related grade.

It is a fossil, not a racial label for living people.

Introduction

Rhodesian Man is the Kabwe skull from Zambia, once Northern Rhodesia. It is a robust archaic Homo fossil, not a living race.

Body

The find

- **A. S. Woodward** named ***Homo rhodesiensis*** in 1921 from **Broken Hill** (Kabwe) mine.
- The skull has a huge **supraorbital torus**, a low vault, and a cranial capacity in the later **Homo range**.
- Dates are debated; many now place it in the Middle Pleistocene.

How it is classified

- Older texts kept a separate species. Many workers now sink it in ***Homo heidelbergensis*** or a broad archaic grade beside **Bodo** and **Saldanha**.
- Dental disease on the specimen is famous; it is pathology, not a type character.
- It is African archaic Homo, relevant to the later rise of ***H. sapiens***, not a 'missing link' cartoon.

Flow diagram

Kabwe Broken Hill -> Rhodesian Man

Rhodesian Man -> Archaic Homo heidelbergensis grade

Archaic Homo heidelbergensis grade -> Later sapiens debate

Conclusion

- **Rhodesian Man is the Kabwe calvaria:** a Middle Pleistocene African archaic Homo. The name is historical; the biology sits with *heidelbergensis*-grade fossils.

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Q5(c) · 10 marks

Neolithic Cultures of India

Anthropology GS 1 · 2016 · Neolithic

Revision summary

The Indian Neolithic is early farming with ground stone.

Burzahom, southern ashmounds, and Ganga sites are type regions.

Mehrgarh anchors the northwest farming story.

Pottery and sedentism arrive in local orders.

It is several cultures, not one Neolithic people.

Introduction

Indian Neolithic cultures are the first farming and herding village sets, with ground stone and, later, pottery. They are regional, not one migration.

Body

Regions

- **Kashmir: Burzahom** pit-dwellings, polished tools, and later megalithic contact.
- **Vindhyan-Ganga: Koldihwa** and **Mahagara** with early rice claims that remain debated.
- **South: Ashmounds** of cattle dung in Karnataka, **Utnur**, **Piklihal**, and **Brahmagiri** sequences after **Wheeler** and **Allchin**.
- **Northeast** and **eastern** India: shouldered celts and rice in a different package.
- **Mehrgarh** in Baluchistan is the western farming gateway, often taught with the Indian Neolithic story.

Features

- Domestication, sedentism, and polished axes. Metal is still rare. **Sankalia** and **Paddayya** stressed local process.

Flow diagram

Indian Neolithic -> Burzahom

Indian Neolithic -> Ashmounds Karnataka

Indian Neolithic -> Koldihwa rice

Indian Neolithic -> Mehrgarh west

Conclusion

- **Indian Neolithic cultures are regional farming beginnings:** Kashmir pits, southern ashmounds, Ganga rice debates, and Mehrgarh to the west. Ground stone is the shared fossil director.

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<https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/neolithic-cultures-of-india/>

Q5(d) · 10 marks

Fertility and Fecundity

Anthropology GS 1 · 2016 · Biological and socio-ecological factors influencing fecundity, fertility, natality and mortality.

Revision summary

Fecundity is the ability to conceive.

Fertility is the count of live births.

Intermediate variables connect the two.

Indian age at marriage and breastfeeding are cultural brakes or accelerators.

Infertility and high fertility are different public problems.

Introduction

Fecundity is the biological capacity to conceive. Fertility is the actual production of live births. Demography and anthropology keep the two apart.

Body

The distinction

- A fecund couple may have low fertility because of late marriage, breastfeeding, contraception, or loss.
- **Natural fertility** populations, in **Henry's** sense, lack deliberate parity limitation but still space births by lactation.
- **Davis and Blake** listed intermediate variables: intercourse, conception, and gestation.

Anthropology

- Age at marriage, widow remarriage, and son preference shape Indian fertility more than fecundity alone.
- Infertility stigma is social. Biomedical fecundity problems need clinics; high fertility needs policy and gender analysis.
- **Bongaarts** later modelled proximate determinants that operationalise the same split.

Flow diagram

Fecundity capacity -> Marriage lactation contraception

Marriage lactation contraception -> Fertility live births

Conclusion

Fecundity is potential. Fertility is births achieved. Culture sits between them, which is why anthropology belongs in population study.

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<https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/fertility-and-fecundity/>

Q5(e) · 10 marks

Forensic Anthropology.

Anthropology GS 1 · 2016 · Applications of Anthropology

Revision summary

Forensic anthropology identifies unknown remains from bone.

It estimates age, sex, stature, and trauma.

Disaster and rights work use the same kit.

DNA supplements morphology.

Taphonomy stops over-reading every crack as a crime.

Introduction

Forensic anthropology applies osteology and human variation to legal identification. It reads bone when soft tissue will not name the person.

Body

Tasks

- Estimate **age**, **sex**, **stature**, and a broad **ancestry** from the skeleton.
- Read **trauma**, burning, and time since death, with taphonomy as a caution.
- Assist **DVI** after disasters and human-rights exhumations, as **Clyde Snow** showed.

Methods

- Pelvis and skull for sex; pubic symphysis and dentition for age; long-bone regression for stature.
- DNA from bone now joins, it does not erase, morphological skill.
- Indian practice sits in forensic medicine departments with anthropology support.

Flow diagram

Forensic anthropology -> Age sex stature

Forensic anthropology -> Trauma taphonomy

Forensic anthropology -> DVI DNA records

Conclusion

- **Forensic anthropology is legal osteology:** a biological profile and trauma from remains, then a match to records or DNA.

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<https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/forensic-anthropology/>

Q6(a) · 20 marks

Elucidate the biological and cultural factors in Human evolution.

Anthropology GS 1 · 2016 · Biological and Cultural factors in human evolution.

Revision summary

Bipedalism and a large, slow-growing brain are biological platforms.

Stone tools, fire, and sharing are cultural forces.

Washburn treated tools as a cause of further anatomy.

Hrdy's alloparents help explain childhood.

Lactase persistence shows the loop continuing.

Introduction

Human evolution is a two-way process. Somatic change opened new habits; tools, fire, and teaching then selected further biology.

Body

Biological factors

- **Bipedalism** in **Australopithecus**, with **Laetoli** footprints, freed the hands and changed the birth canal.
- Brain enlargement, reduced canines, and a longer childhood mark **Homo habilis** and **Homo erectus**.
- Sweat cooling, endurance walking, and dietary shifts, including **Wrangham's** cooking hypothesis, lowered gut cost.
- **Life history**: helpless infants need carers, which **Hrdy** ties to cooperative breeding.

Cultural factors

- **Oldowan** and **Acheulian** tools at **Olduvai** and **Attirampakkam** extend diet and range.
- Fire, shelter, clothing, and later language store knowledge outside the body.
- Food sharing and division of labour make a social niche. **Tomasello** calls the result cumulative culture.
- **Washburn** argued tools selected the human hand, not only the reverse.

Feedback still visible

- **Lactase persistence** and high-altitude alleles show gene-culture coevolution after the Pleistocene.
- Neither biology nor culture is a residual. The human niche is both.

Flow diagram

Bipedal brain childhood -> Tools fire language
Tools fire language -> Selection on body
Selection on body -> Bipedal brain childhood

Conclusion

Biological factors are bipedalism, brain, and delayed growth. Cultural factors are tools, fire, sharing, and teaching. Evolution of humans is their feedback, not a choice of one side.

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WRAP Exams

Q6(b) · 15 marks

Explain the role of heredity and environment in the formation of races.

Anthropology GS 1 · 2016 · Race and racism, biological basis of morphological variation of non-metric and metric characters. Racial criteria, racial traits in relation to heredity and...

Revision summary

Some traits are heritable and locally selected.

Most genetic variation is within groups, not between classical races.

Environment and plasticity change the growing phenotype.

Boas showed that 'racial' head form shifts with place.

Populations form by clines and admixture, not pure types.

Introduction

Classical 'races' were treated as hereditary types. Living human variation is clinal, polygenic, and always jointly shaped by genes and environment.

Body

Heredity

- Skin colour, some body proportions, and many blood polymorphisms have a genetic component.
- **Bergmann** and **Allen** trends, **sickle cell**, and **lactase** alleles show selection in place, not a three-race Noah's ark.
- **Lewontin** showed most genetic diversity is within continental groups. Race as a few boxes fails the genome.

Environment

- **Sun, diet, altitude, and disease shape phenotype through growth: Tanner** secular trends, **Andean** and **Tibetan** hypoxia answers.
- **Plasticity**: the same genotype yields different stature in famine and plenty. **Boas** immigrant studies already showed head form is not a fixed race mark.
- **Culture is environment**: clothing, marriage networks, and caste endogamy structure gene flow.

Formation, not types

- Populations form by isolation, selection, drift, and admixture. They do not form as pure races.
- Forensic ancestry estimates are statistical. They are not a return to colonial race science.

Flow diagram

Human variation -> Alleles selection drift

Human variation -> Climate diet culture

Alleles selection drift -> Populations clines

Climate diet culture -> Populations clines

Conclusion

Heredity supplies alleles under selection and drift. Environment and culture shape both gene frequencies and the growing body. Races as fixed hereditary types are a poor model of that process.

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WRAP Exams

Q6(c) · 15 marks

Discuss different factors affecting growth and development in human beings.

Anthropology GS 1 · 2016 · Factors affecting growth and development

Revision summary

Genes and hormones set tempo and a stature range.

Nutrition and infection decide whether that range is reached.

Altitude, toxins, and workload add environmental load.

Secular trend and feeding bias are cultural-historical factors.

Tanner charts make the factors visible as velocity.

Introduction

Growth is increase in size. Development is change in proportion, maturity, and function. Both answer to genes, hormones, nutrition, disease, and the social house.

Body

Genetic and endocrine

- Polygenic stature, sex chromosomes, and syndromes such as **Turner** set a range.
- **GH**, thyroid, and sex steroids time the infant, childhood, and adolescent spurts that **Tanner** charted.

Nutrition and disease

- Protein-energy lack, iodine, iron, and zinc deficits stunt. Infection and diarrhoea cut velocity.
- Catch-up growth can occur if the insult ends early.

Environment and culture

- Altitude, climate, and workload shape chest and muscle. Prenatal smoking and alcohol harm.
- **Secular trend:** better food and sanitation raise adult height across generations.
- Gender bias in feeding, as in some Indian households, is a cultural growth factor.
- Emotion and deprivation, as in neglected children, also flatten curves.

Method note

- Longitudinal studies separate tempo from size. One school weighing cannot.

Flow diagram

Growth development -> Genes hormones
Growth development -> Nutrition infection
Growth development -> Care gender class

Conclusion

Human growth is gene and hormone range filled or emptied by food, infection, altitude, and care. Anthropology watches the household as much as the endocrine axis.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/discuss-different-factors-affecting-growth-and-development-in-human-beings/>

WRAP Exams

Q7(a) · 20 marks

Critically discuss the Mendelian principles and their application to human populations.

Anthropology GS 1 · 2016 · Human Genetics

Revision summary

Segregation and independent assortment are the core Mendelian laws.

Human pedigrees of recessives, dominants, and X-linked traits apply them.

Hardy-Weinberg is Mendelism at population scale.

Consanguinity and caste mating violate random-mating assumptions.

Polygenic traits and eugenic history are the critique.

Introduction

Mendel's principles explain how discrete traits move from parents to offspring. In human populations they work, and they need Hardy-Weinberg, linkage, and culture before they become demography.

Body

The principles

- **Segregation:** alleles of a locus separate in gametes. **Independent assortment:** unlinked loci mix independently.
- **Dominance** is a phenotypic relation, not a moral one. Recessive traits hide in heterozygotes.
- **Mendel** used peas. Humans added sex linkage, as in **haemophilia**, and mitochondrial exceptions.

Application to human populations

- Pedigrees for **albinism**, **PTC**, **achondroplasia**, and **thalassaemia** are Mendelian teaching files.
- **Hardy-Weinberg** turns Mendel into population frequencies if mating is random and selection is nil.
- **Consanguinity**, studied by **Sanghvi** in India, raises homozygosity for recessives.
- Blood groups applied Mendelism at scale. Forensic STRs still assume Mendelian transmission.

Critical limits

- Most stature and skin traits are **polygenic**, not one-pea genes.
- **Linkage**, **imprinting**, **penetrance**, and **phenocopies** break textbook ratios.
- Culture decides who mates. Caste and village endogamy are not bean-bag random mating.
- **Eugenic** misuse of Mendelism was political. Counselling today is voluntary and case-based.

Flow diagram

Mendel segregation assortment -> Human pedigrees

Human pedigrees -> Hardy Weinberg

Hardy Weinberg -> Polygenic consanguinity culture

Conclusion

Mendelian principles still govern single-locus human traits and forensic markers. Population application needs Hardy-Weinberg plus a map of marriage. Polygenic and cultural facts stop a pea-garden view of whole peoples.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/critically-discuss-the-mendelian-principles-and-their-application-to-human-populations/>

WRAP Exams

Q7(b) · 15 marks

Explain the significance of screening and counseling for genetic disorders.

Anthropology GS 1 · 2016 · Numerical and structural aberrations (disorders).

Revision summary

Screening searches a defined group for genetic risk.

Newborn, cascade, and prenatal programmes are the main types.

Counselling explains risk without directing the choice.

Significance is prevention, early treatment, and informed reproduction.

Stigma and eugenics are the failures to avoid.

Introduction

Screening finds people at raised risk. Counselling turns that finding into an informed, voluntary decision. Together they are the public face of medical genetics.

Body

Screening

- **Population screening targets common, treatable, or preventable conditions:** newborn TSH, sickle, thalassaemia in high-prevalence Indian belts.
- **Cascade screening** starts from a proband and tests relatives, as in **familial cancers** or translocation Down's.
- **Prenatal tools:** NIPT, ultrasound, and diagnostic CVS or amnio after consent.
- **Significance:** early diet, transfusion programmes, and fewer surprise stillbirths. Harm: false positives and stigma if community work is crude.

Counselling

- Non-directive explanation of recurrence risk, using pedigrees first, as **Garrod** to modern clinics.
- **Sanghvi**-type consanguinity contexts need extra care, not blame.
- **Significance:** autonomy, timing of marriage information, and support after a diagnosis.
- **Ethics:** confidentiality, the right not to know, and no state eugenics.

Anthropology's warning

- Screening without counselling is a lab. Counselling without accessible care is empty talk.

Flow diagram

Screening -> Find high risk
Find high risk -> Counselling
Counselling -> Voluntary decision care

Conclusion

Screening detects risk early. Counselling protects choice and meaning. Their significance in India is thalassaemia, newborn, and prenatal programmes done with consent, not coercion.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/explain-the-significance-of-screening-and-counseling-for-genetic-disorders/>

WRAP Exams

Q7(c) · 15 marks

Describe the scope of Epidemiological Anthropology in the study of infectious and non-infectious diseases.

Anthropology GS 1 · 2016 · Epidemiological Anthropology

Revision summary

The field links disease rates to culture and environment.

Infections follow water, crowding, stigma, and zoonotic edges.

Non-infectious disease follows diet, work, and early-life nutrition.

Kleinman's models explain treatment uptake.

Scope is biosocial explanation for prevention.

Introduction

Epidemiological anthropology studies how culture, ecology, and inequality shape who falls ill. It joins rates to meaning for both infections and chronic disease.

Body

Infectious disease

- Contact, water, housing, and ritual gathering spread microbes. **John Snow** mapped cholera; anthropology asks why people draw that water.
- **Malaria** and sickle cell, **TB** and crowding, **HIV** and stigma, **COVID** and caste-class space are field topics.
- **McKeown** and later biosocial work show nutrition and sanitation shifting infection long before a new drug in some histories.
- Zoonoses at the forest-farm edge need tribal and market ethnography, not only a lab.

Non-infectious disease

- **Diabetes**, hypertension, and cancer follow diet transition, sitting work, and fetal undernutrition (**Barker**).
- Gender, stress, and tobacco are cultural exposures. **Kleinman's** explanatory models show why pills fail when the illness is read as fate.
- Occupational dust and urban air are political environments.

Scope

- **Method:** ethnography plus prevalence. Aim: better programmes, not a romantic of 'traditional immunity'.

Flow diagram

Epidemiological anthropology -> Infection contact ecology

Epidemiological anthropology -> Diet stress inequality

Epidemiological anthropology -> Prevention programmes

Conclusion

Epidemiological anthropology's scope is the social production of infection and of chronic disease. It explains rates with kinship, work, stigma, and ecology, then feeds prevention.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/describe-the-scope-of-epidemiological-anthropology-in-the-study-of-infectious-and-non-infectious-diseases/>

WRAP Exams

Q8(a) · 20 marks

Describe the role of Anthropology in designing defence and other equipment.

Anthropology GS 1 · 2016 · Applications of Anthropology

Revision summary

Design needs Indian body dimensions, not only NATO tables.

Defence uses surveys for helmets, seats, suits, and loads.

Dynamic reach and vision matter as much as stature.

Civil PPE and cockpits use the same applied anthropology.

Reject martial-race myths; use percentiles and sex-specific fits.

Introduction

Anthropology enters equipment design through human biology and human variation. Defence kit that fits a census average can fail a real soldier, pilot, or worker.

Body

Anthropometry as design input

- **Static** measures (stature, sitting height, reach, hip breadth) set cockpit, hatch, and body-armour sizes.
- **Dynamic** measures (range of motion, grip, vision cones) set controls and sightlines.
- Indian defence has used **DRDO** and service anthropometric surveys because imported NATO percentiles do not match Indian bodies.

Defence applications

- Helmets, oxygen masks, NBC suits, parachute harnesses, and tank seats need sex- and region-aware size rolls, not one 'universal man'.
- Load carriage and boot last design prevent stress fracture and cold injury.
- **Human factors** after **Fitts** and later ergonomics treat the soldier as a system, not a uniformed average.

Other equipment

- **Industry:** machine guards, vehicle cabins, furniture, and PPE for women workers often ignored by male-only samples.
- **Space and aviation:** NASA and IAF cockpit studies are applied somatology.
- **Disability and ageing:** inclusive design is the same method with different percentiles.

Role, critically

- Anthropology supplies variation, growth, and culture of use (sari, turban, sitting habits).
- It must refuse racial 'martial type' myths. Fit the person; do not mythologise a tribe as a weapon.

Flow diagram

Anthropometry variation -> Helmet cockpit armour

Anthropometry variation -> Industry PPE furniture

Helmet cockpit armour -> Fit not racial type

Conclusion

Anthropology designs defence and civil equipment by feeding anthropometry, motion, and cultural dress into engineering. The role is to make kit fit Indian bodies and uses, not a foreign percentile or a racial cartoon.

Open WRAP page — <https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2016/describe-the-role-of-anthropology-in-designing-defence-and-other-equipment/>

Q8(b) · 15 marks

Discuss the genetic and non-genetic factors in the bio-cultural adaptations of human beings to different environments.

Anthropology GS 1 · 2016 · Concepts and methods of Ecological Anthropology: Bio-cultural Adaptations

Revision summary

Genetic adaptations include malaria alleles, altitude genes, and lactase.

Non-genetic adaptations are sweating, ventilation, and developmental shape.

Culture-clothes, food, houses-does most polar and desert work.

Farming and malaria show culture selecting genes.

No environment is solved by DNA alone.

Introduction

- **Humans occupy desert, high altitude, Arctic, and wet tropics. Adaptation is biocultural:** some of it is allele, much of it is plastic physiology and technology.

Body

Genetic factors

- **Sickle cell** and **thalassaemia** in malaria ecology.
- **Tibetan EPAS1** and Andean haemoglobin patterns as different genetic altitude answers.
- **Lactase persistence** with dairying. Skin pigmentation clines with UV.
- These are population frequencies, not a passport for one person.

Non-genetic factors

- **Acclimatization:** ventilation at altitude, sweating in heat, shivering and clothing in cold.
- **Developmental plasticity:** chest growth in high-altitude children.
- **Culture:** Inuit diet and parkas, desert tents, monsoon agriculture, caste water rules that also spread or block infection.
- **Behaviour:** siesta, migration, and fire are adaptations without a new mutation.

Bio-cultural

- **Livingstone** on malaria and farming: culture changed the genetic landscape.
- A Tibetan village uses genes, large lungs, tea, and housing together.

Flow diagram

Environment -> Alleles sickle EPAS1 lactase
 Environment -> Acclimatization culture
 Alleles sickle EPAS1 lactase -> Biocultural adaptation
 Acclimatization culture -> Biocultural adaptation

Conclusion

Genetic factors are selected alleles for malaria, altitude, milk, and sun. Non-genetic factors are acclimatization, growth, and culture. Human adaptation to environments is almost always both.

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WRAP Exams

Q8(c) · 15 marks

Explain the skeletal changes due to erect posture and their implications.

Anthropology GS 1 · 2016 · Characteristics of Primates

Revision summary

Bipedalism moved the skull balance point and curved the spine.

The pelvis became a bowl for viscera and abductor gait.

Valgus knee and arched foot make a striding platform.

Hands were freed for tools.

Back pain and tight birth are the biological bill.

Introduction

Erect bipedal posture rebuilt the skeleton from skull to foot. The same changes enable free hands and also produce human back, birth, and joint costs.

Body

Main changes

- **Foramen magnum** moves under the skull so the head sits on a vertical spine.
- **Spine:** lumbar and cervical **lordosis**; a vertebral column that springs and also slips.
- **Pelvis:** short, wide, bowl-shaped; ilium reoriented for gluteal abductors, as **Lovejoy** stressed for the Trendelenburg gait.
- **Lower limb:** valgus **knee**, long femur, stable **platform foot** with adducted hallux and arches.
- **Thorax** and shoulder free the arm from locomotion. Hands become precision tools.
- **Sacrum** and pelvic inlet-outlet twist complicate **obstetrics** with a large fetal head (**Washburn's** obstetrical dilemma debate).

Implications

- Efficiency of walking and carrying. Heat dumping on the savanna.
- **Pathology:** lumbar disc, hernia, varicose veins, haemorrhoids, fallen arches, difficult labour.
- Culture answers with midwifery, tools, and chairs-which then create new back strain.

Flow diagram

Erect posture -> Foramen magnum lordosis

Erect posture -> Bowl pelvis valgus knee

Erect posture -> Arched adducted foot

Erect posture -> Hands free obstetric cost

Conclusion

Erect posture shifted the foramen magnum, curved the spine, remodelled pelvis and foot, and freed the hand. Implications are locomotor success plus a lifetime of mechanical and obstetric trade-offs.

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WRAP Exams

Compiled answer key

Last pages of this pack. Each question links to the WRAP model answer on wrapexams.com.

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Q1(a) 10 marks	Q1(b) 10 marks	Q1(c) 10 marks	Q1(d) 10 marks
Q1(e) 10 marks	Q2(a) 20 marks	Q2(b) 15 marks	Q2(c) 15 marks
Q3(a) 20 marks	Q3(b) 15 marks	Q3(c) 15 marks	Q4(a) 20 marks
Q4(b) 15 marks	Q4(c) 15 marks	Q5(a) 10 marks	Q5(b) 10 marks
Q5(c) 10 marks	Q5(d) 10 marks	Q5(e) 10 marks	Q6(a) 20 marks
Q6(b) 15 marks	Q6(c) 15 marks	Q7(a) 20 marks	Q7(b) 15 marks
Q7(c) 15 marks	Q8(a) 20 marks	Q8(b) 15 marks	Q8(c) 15 marks

Question-wise key

Q1(a) · 10 marks Solution

Q1(b) · 10 marks Solution

Q1(c) · 10 marks Solution

Q1(d) · 10 marks Solution

Q1(e) · 10 marks Solution

Q2(a) · 20 marks Solution

Q2(b) · 15 marks Solution

Q2(c) · 15 marks Solution

Q3(a) · 20 marks Solution

Q3(b) · 15 marks Solution

Q3(c) · 15 marks Solution

Q4(a) · 20 marks Solution

Q4(b) · 15 marks Solution

Q4(c) · 15 marks Solution

Q5(a) · 10 marks Solution

Q5(b) · 10 marks Solution

Q5(c) · 10 marks Solution

Q5(d) · 10 marks Solution

Q5(e) · 10 marks Solution

Q6(a) · 20 marks Solution

Q6(b) · 15 marks Solution

Q6(c) · 15 marks Solution

Q7(a) · 20 marks Solution

Q7(b) · 15 marks Solution

Q7(c) · 15 marks Solution

Q8(a) · 20 marks Solution

Q8(b) · 15 marks Solution

Q8(c) · 15 marks Solution

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