

2015 George Oppen: Questions courtesy of Anne Hathaway's cow-milking fingers
Written by Auroni Gupta, Stephen Eltinge, and Mike Cheyne
ROUND 7

TOSSUPS

1. The number one is subtracted from this quantity in the formula for a system's Damkohler number. The overall amount for this quantity is calculated by finding the partial amounts for it in the Ostwald isolation method. This quantity and initial concentration must be the same for all processes in a system so that Wegscheider's principle applies. The units of the pre-exponential factor A depend on this quantity; for example, A has units inverse-seconds when this quantity is equal to (*) one. An easy way to determine this quantity is to find the slope of the natural log of rate with respect to the natural log of a reactant's concentration. For chain and radical reactions, this quantity, which is frequently mistaken for molecularity, is often fractional, and when it is equal to two, a simplifying assumption where this quantity is "pseudo first" is often employed. For 10 points, identify this quantity, which for a substance in a chemical reaction corresponds to the exponent to which that substance's concentration is raised in the rate law.

ANSWER: order of a reaction

2. This author declares that the 21st century belongs to cats and dogs, in a poem which describes carts full of them floating on the street toward Walt Whitman. This author wrote that "I toy with my nation. I see its future glimpsed through the eyelashes of an ostrich," in one of the prose "Psalms" found in his best-known book. This author described the Statue of Liberty holding up a rag called "freedom" with one hand, and "choking a child named Earth" with the other, in his poem "A Grave for New York." A book by this author examines the parallels between Surrealism and Sufism. This poet's most ambitious work is a three-volume epic whose speaker, employing the poet (*) al-Mutannabi as a guide, travels throughout the sixth- to ninth- century Arab world, titled simply *The Book*, or *Al Kitab*. This author adopts the guise of a different medieval Arab poet in his best-known collection. For 10 points, name this author of the *Songs of Mihyar the Damascene*, a dissident Syrian poet with a Greek mythological pseudonym.

ANSWER: Adonis [or Adunis; or Ali Ahmad Said Esber]

3. This project's completion forced John Pickering to abandon his similar effort after 48 pages had already been printed. After learning about this project, Albert Gallatin wrote two ethnographic works about North and South America. The obsessiveness of this project's undertaker was mistaken for witchcraft and he had to face a trial in which his daughter Ayoka helped him. This undertaking paved the way for the establishment of a newspaper known as the Phoenix, whose editor (*) Elias Boudinot got rid of 1.16% of this project's results. This project, which was inspired by the "talking leaves" its undertaker saw while fighting at the Battle of Horseshoe Bend, enabled Samuel Worcester to complete his translations of the Bible, and resulted in the creation of 86 characters, many resembling Cyrillic or Greek letters. For 10 points, name this project undertaken by Sequoyah, which created a reading and writing system for a Native American tribe.

ANSWER: creation of the Cherokee alphabet [or Cherokee syllabery]

4. A person with this profession was depicted in Edward Steichen's photograph *The Silhouette -- 4 am*. A person with this profession sits on a rocky outcropping and extends his hand to the sea in a sculpture intended as a companion piece to Jean-Antoine Injalbert's *Mirabeau* statues. An artist dipped a dressing gown in plaster and draped it over a nude statue of a person with this profession, whose proportions were determined by interviewing his tailor. Jacob Epstein incorporated a (*) sphinx into his design for a tomb for a person with this profession, which since 2011 is surrounded by a glass barrier to prevent people from kissing it. Twenty-two years after its creator's death, a sculpture of this sort of person was cast in bronze and placed on the Boulevard de Montparnasse. A monument to a person of this kind is the most popular attraction at the Pere Lachaise Cemetery in Paris, and features an epitaph taken from *The Ballad of Reading Gaol* (JAIL). For 10 points, name this profession of Auguste Rodin's subject Honore de Balzac.

ANSWER: authors [or writers; accept specific types, such as poets, novelists, playwrights, dramatists, and essayists]

5. It's not in Croatia, but the Basilica of Saint Euphemia in this city was founded by a bishop who apparently had the unusual first name of "Senator." The hymn "Veni redemptor gentium" was written by an inhabitant of this city, which was where the twin patron saints of haymakers, named Gervasius and Protasius, were killed. A document named for this city built upon Galerius's declaration at Nicomedia two years prior. The Agnus Dei is omitted, the Gospel is followed by a short antiphon, and Advent lasts for six weeks in a liturgical rite developed in this city, whose creator acknowledged the importance of flexibility in following it by coining an expression known today as "When in (*) Rome, do as the Romans do." For massacring 7,000 people in Thessalonica, a bishop from this city excommunicated Emperor Theodosius. The Te Deum was written in this city for the occasion of the baptism of Saint Augustine. For 10 points, name this large Italian city, home to Saint Ambrose, where Constantine the Great issued an "Edict" guaranteeing freedom of religion for Christians in the Roman Empire.

ANSWER: Milan

6. The mad scientist Zoanthrothago reduces this fictional character to one-fourth his original size. This character kills Major von Schneider in a novel so rabidly anti-German that the author promised to write his next book with a German pen-name. The criminally few authorized novels about him other than the original twenty-four include Philip Jose Farmer's *The Dark Heart of Time*. In a crossover with his creator's *Pellucidar* series, this character joins Jason Gridley's expedition to the Earth's inner core. Olympic (*) swimmer Johnny Weissmuller came up with this character's signature sound effect. He goes to Wisconsin and finds that his love interest is engaged to his cousin William Clayton, in a novel that begins with his birth in a log cabin following his parents' escape from a mutiny. This character matures in a montage set to Phil Collins's "Son of Man," succeeds the dying Kerchak, and falls in love with professor Archimedes Q. Porter's daughter Jane in a 1999 Disney film. For 10 points, name this protagonist of a progressively-unhinged novel series by Edgar Rice Burroughs.

ANSWER: Tarzan [accept John Clayton before mention; accept Viscount Greystoke; accept Earl Greystoke; accept Duke Greystoke]

7. A protein that opposes this process is the main ligand of activin receptors type-2B, and is knocked out in "mighty mice." The endocytic recycling protein EHD2 interacts with ferlin proteins to regulate part of this process. It's not fertilization, but the last stage of this process is mediated by transmembrane proteins known as tetraspanins and metalloproteinases known as meltrins. Impaired DNA binding in types 1 and 3 of Waardenburg syndrome result in this process due to mutations of Pax3. Transcription factors such as (*) Myf5, MRF4, and Mef2 are crucial for this process. It's not repair, but non-glial satellite cells are activated prior to this process. In this process, a portion of the somite known as the namesake "tome" is filled with namesake "blasts" that fuse to form tubular cells made up of "fibril" subunits. For 10 points, name this process which forms a tissue that comes in cardiac, smooth, and skeletal types.

ANSWER: myogenesis [or muscle development; or muscle growth; accept similar answers; accept answers such as myocyte fusion]

8. In a play by this author, a woman sings "Nearer My God, Thee" as the curtain closes over the corpse of a man she had strangled in a greenhouse. This playwright created an unhinged character who unpacks a tea set, then douses the straw from the package with kerosene to start a fire in her own house. A short play by this author ends with a woman frantically hiding a box in her coat just as the doorknob turns. The Orange Tree Theater, known for championing this author's plays, premiered her posthumously-published play *Springs Eternal*. Elsa Stanhope resolves to publish the long-withheld poetry of her aunt in a Pulitzer-winning play by this author. In her most famous play, Henry Peters and Lewis Hale ignore the (*) "kitchen things" in a crime scene, which is where their wives discover a canary with its neck broken in the same manner as the murder victim John Wright. She adapted that play into her story "A Jury of Her Peers." For 10 points, name this author of *Alison's House* and *Trifles*, who scouted out Eugene O'Neill as founder of the Provincetown Players.

ANSWER: Susan Glaspell [or Susan Keating Glaspell]

9. A brief guardian of this king in his youth yanked a gold chain off an enemy's neck, thereby earning the nickname "Bell the Cat." This king repeatedly bailed out his troublesome privateer Andrew Barton. This king ordered the construction of a new dockyard to house his gigantic ship the *Great Michael*, prompting his rival to build the even larger *Great Harry*. This man's court included the Italian-born alchemist Father John Damian, the frequent butt of *makar* William Dunbar's jokes. This king broke his own Treaty of (*) Perpetual

Peace a mere ten years after signing it. This king financed the wedding of his distant cousin Lady Catherine Gordon to the pretender Perkin Warbeck, whom he supported. Catherine of Aragon sent a piece of this man's bloody coat to her husband, after this man renewed the Auld Alliance with France and perished in Northumberland on an ill-conceived invasion of England. For 10 points, name this king of Scotland who died at the Battle of Flodden Field.
ANSWER: King James IV [prompt on James]

10. Critics are torn about whether to count a painting with a piano in its lower right corner as part of this series. This series includes a painting in which a woman wearing a flower consisting of six ovals messily surrounding a circle looks away as she holds a glass placed on a tray served up by a disembodied hand. The artist of this series took a break and included several images of pigeons that he had observed outside his studio porch. The best-known individual image from this series includes the artist's own pet dachshund Lump, and is illuminated by white light streaming in from a window into a room hued in black and grey. This series is housed together in five adjoining (*) palaces in Barcelona, and is more extensive than the artist's similar treatment of *The Women of Algiers*. The majority of the paintings in this sequence consist of different views of the Infanta Margarita. For 10 points, name this series of fifty-eight paintings by Picasso, a set of variations on a painting of the Spanish court by Velasquez.
ANSWER: Las Meninas

11. During this battle, the radio operator and spy Patrick Heenan was executed for treason. A particularly grisly part of this battle was the massacre of patients and doctors alike at the Alexandra Barracks Hospital. The losing side of this battle surrendered at the Ford Motor Factory, in the wake of which some of their soldiers were organized by Rash Behari Bose into a pro-independence Indian National Army. Contrary to an oft-repeated myth about this battle, its losing side's naval guns were not (*) mistakenly faced south rather than north. Three months before, near the site of this battle, the HMS *Repulse* and *Prince of Wales* were sunk. Following this battle, the city's Chinese elite were killed in the Sook Ching Massacre. In this battle, troops led by General Yamashita rode down on bicycles and set up shop in the palace of the Sultan of Johor before forcing the largest surrender in British history. For 10 points, name this battle in which the Japanese gained the "Gibraltar of the East" at the tip of the Malay peninsula.
ANSWER: Battle of Singapore

12. The earliest surviving marble building in Rome is a temple to this deity in the Forum Boarium, consisting of a circle of twenty Corinthian columns surrounding a cella. During the first week in the lives of Roman boys, before they were even named, food was offered to this deity on their behalf. On the morning of their weddings, brides had their mothers fasten belts, known as the knots of this deity, around their waists. The emperor Caracalla believed himself to be the reincarnation of this god, whose son Aventinus is the namesake of the Aventine Hill. Evander venerates this god for tearing the top off a mountain to reach an adversary who had (*) sealed off a cave with a boulder, and then strangling that fire-breathing giant so hard that his eyes popped out. The Villa of the Papyri was located in a city named for this god. This hero killed Cacus for stealing some of the cattle that he himself had taken from Geryon. For 10 points, name this Roman version of the hero who carried a club and wore a lionskin while undertaking his twelve labors.
ANSWER: Hercules [or Heracles; accept aspects of Hercules, such as Hercules Victor]

13. A cultural account of the English form of this concept was provided by Marilyn Strathern in her book *After Nature*. David Murray Schneider launched a "project" studying this concept among the lower-middle class in the United States and Great Britain. Harrison White introduced abstract algebra into the study of this concept in his monograph *An Anatomy of it*. Locating the "atom" of this concept is the goal of the (*) "alliance theory" approach for studying it. The Crow, Iroquois, Sudanese, and Hawaiian patterns of terminology for this subject are among the six identified by Lewis Henry Morgan. Many Western Pacific cultures use "dyadic terms" when talking about this phenomenon. "Fictive" forms of this phenomenon are based neither on affinal nor consanguineal ties. Claude Levi-Strauss wrote a book about the "elementary structures" of this phenomenon. For 10 points, name this term denoting the social relationships between people in societies.
ANSWER: kinship [accept word forms]

14. A man of this profession loses a contest in which he conjures the tree that guards the Garden of the Hesperides, but his opponent Vanderbast summons Hercules to chop the tree down. In the same play,

another man of this profession creates a gigantic head that intones "Time is," "time was," and "time has been," that he hopes will raise a wall of brass around England. A character of this profession describes "fire and powder / which as they kiss consume," and advises: " love moderately; long love doth so; Too swift arrives as tardy as too slow." Ithamore calls two men of this profession "caterpillars," in a scene in which one of them lays the charge "Thou hast committed," which (*) Barabbas interrupts with "fornication? But that was in another country; And besides the wench is dead." A character of this profession named Francis suggests that Leonato spread the false rumor that Hero has died of grief, in *Much Ado About Nothing*. The most famous Shakespearean character of this profession gives a soliloquy comparing plants to humans, and gives a woman a vial to fake her death, causing her lover to poison himself, which in turn makes her stab herself. For 10 points, name this profession of Laurence, the adviser to Romeo and Juliet.

ANSWER: friar

15. A version of this operator used in the study of chaotic orbits around a galactic center has an extra term parametrized by a variable λ and is named for Henon and Heiles. If the technique used to construct this operator is applied only to cyclic coordinates, then an operator named for Edward Routh is obtained. Constants of motion have a Poisson bracket of zero with this operator. Treating a system with n degrees of freedom in the framework of this operator gives rise to $2n$ first-order (*) equations of motion. The time derivative of the distribution function equals its negative Poisson bracket with this operator according to Liouville's theorem. This operator, whose spatial derivative equals the negative time derivative of momentum according to one of its namesake's equations, can be constructed as the Legendre transform of the Lagrangian. For 10 points, name this operator that gives the total energy of a system.

ANSWER: Hamiltonian [or potential energy before "cyclic coordinates"]

16. In a children's book titled *The Toadstool*, one of these people quickly escapes from a doctor's office. These people were presented with a black neckerchief and brown leather knot to symbolize full membership in an organization abbreviated JM. The "Saxon Greeting" was a gymnastic routine frequently practiced by these people. In 1943, thousands of these people were recruited to work at flak batteries. These people followed by a slogan known as the "3 Ks," and were enrolled in a large organization abbreviated BDM, whose (*) "Faith and Beauty" section offered several vocational courses for them. These people especially were warned not to engage in *Rassenschande*, or "racial defilement." Although only 3,700 of them were employed as concentration camp guards, Nazi exploitation films abound with their sadistic sexual behavior with Jewish inmates. For 10 points, name these people in Nazi Germany who were expected to stay at home to raise perfect Aryan children.

ANSWER: Nazi women [or girls; or females; accept synonyms; prompt on Germans; prompt on children; prompt on youth; prompt on Hitler Youth]

17. In a technique invented by this man, expectation values can be computed by differentiating the generating functional with respect to artificially introduced parameters; that operation can be written in DeWitt notation. This man invented a technique for evaluating integrals that rewrites 1 over AB as an extra integral over the reciprocal of " x_A plus y_B "-squared. That method introduces his namesake parameters and integrates them between zero and one. This man names a technique for evaluating contour integrals that goes under a pole on the left and over a pole on the right, giving his namesake time-ordered (*) propagator. Another of his inventions discretizes a space of interest and integrates over the possible values of a function at every discrete point, resulting in an integral of a complex exponential of the action. That method sums over all possible classical paths to find the quantum amplitude of a trajectory. For 10 points, name this physicist who developed the path integral formulation of quantum mechanics.

ANSWER: Richard Phillips Feynman

18. Composer and piece type required. One of these pieces is often published with three optional cadenzas intended for the composer's friends Lina Schmalhausen, Auguste Rennebaum, and Henri Gobbi. Lazar Berman produced a legendary 1959 recording of some of these pieces for the Melodiya label. In one of these pieces, the left hand plays 54 low Ds in a row in order to imitate the sound of gnomes. One of these pieces ends with a coda in D major that represents the title character being crowned king after rolled chords throughout the majority of the piece represent his rocky journey, strapped to a horse. The composer gave some of these pieces programmatic titles such as (*) "Paysage," "Wilde-Jagd," and "Chasse-Neige." Another of these pieces takes its melody from another composer's second violin concerto, which featured the periodic ringing of

a handbell. For 10 points, name these pieces, which include six inspired by Niccolò Paganini, including "La campanella," and twelve "transcendental" ones, virtuosic study-pieces by a Hungarian composer.

ANSWER: etudes by Franz Liszt [or Liszt etudes; or Ferenc Liszt etudes; prompt on partial answer; prompt to be less specific with answers such as Paganini etudes or Transcendental Etudes]

19. In a chapter of this collection, the author informs us that there have only been five Platos and eight Aristotles in the historical record. This collection relates an anecdote about a ninety year-old woman who, at the peak of her happiness, drinks a bowl of poison to commit suicide, in its chapter "A custom of the isle of Cea." This collection is the source of the oft-quoted ideas "Saying is one thing, doing is another," and "What I fear most is fear." Its author relates a grisly incident in which his own brother perished after being struck above the ear by a (*) tennis ball. A more famous writing in this collection exalts the honesty, virtue, and simple living of South Americans, but chides them for not wearing trousers. The author of this collections states that his personal motto is "What do I know," in the section "An Apology for Raymond Sebond." The title of one of these writings claims that "to study philosophy is to learn to die." For 10 points, name this collection, whose title is French for "attempts," with which Michel de Montaigne invented a new nonfiction genre.

ANSWER: Essays

20. This war is the setting of a story which ends with a man callously shouting "Victory! Victory!" near a woman kneeling between the bodies of her husband and her father. In another story about this war, a watchmaker and a haberdasher cry and shake hands before being executed for refusing to give the password that let them access their favorite fishing spot. The collaborative collection *Evenings at Medan* consists of stories about this war, including "The Attack on the Mill. A soldier in this war exclaims "Let us explode a mine!" before destroying priceless paintings and porcelain in an (*) abandoned mansion, in a story whose heroine rings a long-silent bell after stabbing the title character with a cheese-knife. In the best-known story about this war, a woman who offers food from a picnic basket is coerced into sleeping with an officer so that a stagecoach can continue on to Le Havre. For 10 points, name this war, portrayed realistically in "Two Friends," "Mademoiselle Fifi," "Ball of Fat," and other stories by Guy de Maupassant.

ANSWER: Franco-Prussian War

TB. The Vialov profile describes the shape of a sample of this substance subject only to internal deformation and a constant rate of surface accumulation. The US Naval Research Laboratory's PIPS project is a numerical model for the distribution of this substance, while SHEBA was a yearlong program in 1997 that studied it. The strain rate in this substance is given by a temperature-dependent proportionality constant times the cube of the basal shear stress according to Glen's flow law. Leads and (*) polynyas are gaps in this substance, whose thin "grease" variety is formed by the accumulation of frazil. The removal of this substance leads to earthquakes when isostatic rebound occurs. This substance's high albedo causes positive thermal feedback in situations where the total amount of it changes, which also leads to changes in sea levels. For 10 points, name this stuff found in glaciers.

ANSWER: ice [or sea ice; prompt on glaciers before mention]

BONUSES

1. The South African town of Hermanus employs a town crier who sounds the alarm whenever these animals appear. For 10 points each:

[10] Name these animals, whose "southern right" variety can often be observed off the coast of the Namibian city of "Walvis Bay," which in German just means this kind of bay.

ANSWER: whales [prompt on cetaceans]

[10] Bryde's whales, southern right whales, and humpback whales can be spotted year round in this South African city, situated on Algoa Bay and named for the wife of the acting Cape Colony governor Sir Rufus Donkin.

ANSWER: Port Elizabeth [or PE]

[10] Various nurseries and conservation centers for southern right whales lie along this scenic stretch of South African coast, home to the towns of Plettenberg Bay and George. After Hawaii, this coastal region has the second mildest climate on Earth.

ANSWER: Garden Route [or Tuinroete]

2. In an example of this genre named for St. Gall, St. Augustine gives a brief overview of the major prophets of the Old Testament. For 10 points each:

[10] Identify this medieval dramatic genre, especially popular in Tyrol, focusing on, and named for, the final moments in the life of Jesus Christ, including his arrest, trial, torture, and crucifixion. Greek villagers attempt to stage one of these plays in a Nikos Kazantzakis novel.

ANSWER: passion plays

[10] The best-known passion play to survive into the modern era is the one staged every ten years since 1633 in this Bavarian village, as part of a divine ordinance after the town was spared from the bubonic plague. The play staged here includes infamous anti-Semitic tableaux, like one depicting the spurning of Queen Vashti by King Ahasuerus.

ANSWER: Oberammergau

[10] This author fictionalized his trip with his friend B to see the Oberammergau play in his novel *Diary of a Pilgrimage*, but is better known for a comic novel about a trip along the Thames from Kingston to Oxford.

ANSWER: Jerome K. Jerome [or Jerome Klapka Jerome]

3. All existing *seignories* trace back to the time before the passage of this legislation, after which there were no fresh grants in *frankalmoin*. For 10 points each:

[10] Name this 1290 statute which prevented tenants from alienating, or subletting, their lands via the process of subinfeudation. It is officially known as the Statute of Westminster, but everyone refers to it by the first two words of the document, which mean "because the buyers" in Latin.

ANSWER: Quia Emptores

[10] *Quia Emptores* was passed during the reign of this English king, who subjugated Wales and defeated a rebellion led by William Wallace.

ANSWER: Edward I [or Edward Longshanks; or Hammer of the Scots; or Malleus Scotarum; prompt on Edward]

[10] Prior to Edward, significant property reform had been enacted by the namesake parliament founded by this French-born Earl of Leicester, who came to power after the Second Barons' War and ruled until 1265, when he was killed at the Battle of Evesham.

ANSWER: Simon de Montfort [or Simon V de Montfort; prompt on any partial answer that's underlined]

4. Answer the following about fast days in Judaism, for 10 points each.

[10] The most famous such day is this one on the tenth of Tishrei, in which Jews fast for twenty-five hours to atone for their sins.

ANSWER: Yom Kippur

[10] A much more lenient fast is observed on the eve of this holiday, symbolically condensing a three-day fast celebrated by Jews in scripture into one. In antiquity, the Jews of Shushan celebrated this holiday on the Fifteenth of Adar, a day later than its traditional date.

ANSWER: Purim

[10] The Three Weeks of mourning for the destruction of the First and Second Temples ends on Tisha B'Av and begins on this other calendar day, marking the end of the daily *tamid* offering and the destruction of the twin tablets bearing the Ten Commandments.

ANSWER: Seventeenth of Tammuz [or Shiv'ah Asar b'Tammuz]

5. In 2013, Philip Kim and Andre Geim's groups independently observed this pattern in the Moire superlattice created by graphene on a hexagonal boron nitride substrate. For 10 points each:

[10] Identify this pattern, which arises when electrons in a periodic 2D lattice are exposed to a magnetic field. This recursive, self-similar fractal appears in a color plot of conductance against magnetic field and electron density.

ANSWER: Hofstadter's butterfly

[10] The conductance in Hofstadter's butterfly takes on integer values known as Chern numbers in the quantum version of this effect. In the classical version, a transverse magnetic field deflects charge carriers in a wire, creating a voltage difference.

ANSWER: Hall effect

[10] Chern numbers are quantum numbers described by this adjective, indicating that they are invariant under continuous transformations. Insulators described by this adjective have symmetry-protected conducting states on their surface.

ANSWER: topological [or topological insulators]

6. Laurette's aria "Je crains de lui parler la nuit" from Andre Gretry's opera *Richard Coeur-de-lion* is sung by a woman in this other opera, which popularized the idiom "Life is but a game." For 10 points each:

[10] Name this opera in which the Countess dies of shock when Herman threatens her with a gun, only to take revenge posthumously by feeding him wrong information about her "secret."

ANSWER: The Queen of Spades [or Pikovaya dama; or Pique Dame]

[10] In this other opera by Tchaikovsky based on Pushkin, the title character kills Lensky in a duel, refuses to marry Tatyana, and dances with Olga.

ANSWER: Eugene Onegin [or Yevgeny Onegin]

[10] This first biographer of Tchaikovsky wrote the librettos to his operas *The Queen of Spades* and *Iolanta*, and adapted Dante's *Inferno* into a libretto for Rachmaninov's opera *Francesca da Rimini*.

ANSWER: Modest Ilyich Tchaikovsky [prompt on Tchaikovsky; prompt on Tchaikovsky's brother or similar answers]

7. TGF-beta is thought to be responsible for many forms of this phenomenon, which in the placenta is aided by the secretion of neurokinin B and the formation of a syncytium. For 10 points each:

[10] Identify this phenomenon, in which the eyes and the central nervous system can withstand the introduction of antigens without producing an inflammatory response.

ANSWER: check your immune privilege [or immunological privilege]

[10] Immune privilege can actually work against the eye in sympathetic ophthalmia, in which both eyes become blind after one eye sustains trauma, because these cells never encounter the self eye antigen. These lymphocytes come in helper and cytotoxic varieties.

ANSWER: T cells [or T lymphocytes]

[10] The barrier between the blood and these non-brain body parts is mediated by cells that secrete anti-Mullerian hormone. The inflammation of this organ is termed orchitis.

ANSWER: testes [or testis; or testicles; accept non-medical equivalents as well]

8. This author wrote that "Earth seemed a desert I was bound to traverse" in his most popular poem, which refrains "All, all are gone, the old familiar faces." For 10 points each:

[10] Name this English author who adopted a fictive persona to write his essays "On the Artificial Comedy of the Last Century" and "Christ's Hospital Five-and-Thirty Years Ago."

ANSWER: Charles Lamb [prompt on Elia]

[10] This essay by Lamb, which was set to music by Elgar, consists of a single paragraph in which Lamb tells Alice and John about their great-grandmother, until they gradually disappear and tell him that "we are nothing, we are less than nothing... We are only what might have been."

ANSWER: "Dream-Children; A Reverie"

[10] Along with his sister Mary, Charles Lamb produced a children's book simplifying the plots of this set of writings by a specific author, which were divided into "comedies," "histories," and "tragedies" in the First Folio.

ANSWER: William Shakespeare's plays [prompt on Shakespeare]

9. This speech points out that America's "poets, statesmen, and orators" easily work up a furor over the suppression of the Hungarian Revolution, but remain silent when faced with the bigger problems at home. For 10 points each:

[10] Name this 1852 address before the women of the Rochester Anti-Slavery Sewing Society, which answers its title question with "a day that reveals to him, more than all other days in the year, the gross injustice and cruelty to which he is the constant victim."

ANSWER: "What to the slave is the 4th of July?"

[10] This deliverer of the "What to the slave is the 4th of July?" speech wrote a memoir about his escape from slavery in Baltimore, which he expanded upon in *My Bondage and My Freedom*.

ANSWER: Frederick Douglass [or Frederick Augustus Washington Bailey]

[10] This shorter 1841 speech by Douglass consists of a series of anecdotes about racism in Christian services Douglass attended in both the South and the North. It turns a critical eye against people who "say they like colored men as well as any other, but in their proper place!"

ANSWER: "The Church and Prejudice"

10. The deliverer of this speech collected it in his book *Portraits From Memory*, and it was distilled into a manifesto signed in part by Albert Einstein. For 10 points each:

[10] Name this 1954 speech delivered on BBC Programme 3 shortly after the Bikini Atoll test, which ends with an appeal "as a human being to human beings: remember your humanity, and forget the rest."

ANSWER: "**Man's Peril** From the Hydrogen Bomb"

[10] This British philosopher delivered the "Man's Peril" speech and made his case for atheism in his book *Why I Am Not a Christian*.

ANSWER: Bertrand **Russell** [or Bertrand Arthur William Russell, 3rd Earl **Russell**]

[10] "Man's Peril" draws from Russell's ethical philosophy, which took a turn, aided by Santayana's critique of his "The Element of Ethics," from this viewpoint to its opposite. This is the view that ethical statements can express true or false propositions.

ANSWER: **cognitivism** [accept word forms]

11. Answer the following about violent events in the lead-up to Indian independence, for 10 points each.

[10] Rabindranath Tagore renounced his knighthood in response to the Jallianwala Bagh massacre in this city, which was ordered by Reginald Dyer, who, for some reason, received the *saropa* mark of honor by the Sikh clergyman in this city's Golden Temple for his actions.

ANSWER: **Amritsar**

[10] The radical Hindustan Republican Association carried out this 1925 train robbery, looting a paltry 8000 rupees despite the fact that they specifically targeted a locomotive carrying bags belonging to the British Government Treasury.

ANSWER: **Kakori** Conspiracy [or anything with the word **Kakori**]

[10] A spate of politically-motivated assassinations followed after Lord Curzon announced this 1905 territory-changing action, which was more limited in scope than a similar 1947 action accompanying Indian independence.

ANSWER: **Partition of Bengal** [accept synonyms, accept descriptive equivalents, like the creation of **West and East Bengal**]

12. Local farmhands from the artist's estate *Jas de Bouffan* modeled for this series of paintings, which may have been inspired by a genre scene by the Le Nain brothers. For 10 points each:

[10] Name this series of five oil paintings, including the second most-expensive work of art ever sold, in which Provençal peasants wearing shabby robes and hats gather around a table, smoke pipes, and engage in the title activity.

ANSWER: *The* **Card Players**

[10] This French Post-Impressionist painted *The Card Players* and several views of Mont Sainte-Victoire.

ANSWER: Paul **Cezanne**

[10] In 2010-11, all of *The Card Players* paintings, studies, sketches, and accompanying works were exhibited at the Met and at this London museum famed for its Impressionist and Post-Impressionist collections. This museum also houses the "Princess Gate" collection of Old Masters, Tiepolo, and Rubens.

ANSWER: **Courtauld** Gallery

13. By inverting this equation, multiplying by the substrate concentration, and rearranging, one obtains the Hanes-Woolf plot. For 10 points each:

[10] Name this model of enzyme kinetics relating the reaction rate to V_{max} times the substrate concentration $[S]$, divided by K_m plus $[S]$.

ANSWER: **Michaelis-Menten** equation

[10] Another visualization of the Michaelis-Menten equation, the Lineweaver-Burk plot, displays intersecting lines when enzymes use this mechanism for two substrates. In this mechanism, both substrates bind the enzyme at the same time and produce the namesake complex.

ANSWER: **ternary** mechanism

[10] V_{max} in the Michaelis-Menten equation represents the product of enzyme concentration and this quantity, the maximum number of substrate molecules an enzyme can convert to product molecules per site per unit of time. This value is very high for carbonic anhydrase and acetylcholinesterase.

ANSWER: **turnover** number [or **K_{cat}**]

14. This collection contains a poem about an apocalyptic avian civil war, titled "The Birds of Killingworth," and includes a long sequence paying homage to Norse mythology, titled "The Saga of King Olaf." For 10 points each:
[10] Name this 1863 collection in which tavern patrons tell stories such as "Paul Revere's Ride" in the form of poems.

ANSWER: **Tales of a Wayside Inn**

[10] This author of *Tales of a Wayside Inn* wrote long narrative poems about colonial American history, such as *The Courtship of Miles Standish*, and employed Kalevala meter to write his *Song of Hiawatha*.

ANSWER: Henry Wadsworth **Longfellow**

[10] The Student in *Tales of a Wayside Inn* recites this poem, a parable adapted from the *Decameron* about a poor young man killing his animal companion to feed his eventual wife, which urges the reader that "All things come round to him who will but wait."

ANSWER: "The **Falcon of Ser Federigo**"

15. During the "Allegro assai" movement of this piece, the performer executes the title technique by alternating between two notes using two fingers on one string, while two other fingers play arpeggios on another string. For 10 points each:

[10] Name this extremely-demanding violin sonata by Giuseppe Tartini, supposedly inspired by an encounter with a demonic being in a dream.

ANSWER: **Devil's Trill**

[10] Tartini may have played his own *Devil's Trill* on one of the earliest-known instruments made by this Cremonan luthier with a knack for high sound quality. The "Davidov" instrument made by this man currently belongs to Yo-Yo Ma.

ANSWER: **Stradivarius** [accept word forms, such as **Stradivari**]

[10] This other Baroque Italian composer produced a violin showpiece of comparable difficulty with his caprice "Il labirinto armonico," which is part of his collection of twelve violin concerti titled *L'arte del violono*.

ANSWER: Pietro **Locatelli** [or Pietro Antonio **Locatelli**]

16. The Anglo-Saxon poem "The Seafarer" appeared in the 1915 edition of this collection, whose first poem concerns a group of archers "picking the first fern-shoots." For 10 points each:

[10] Name this collection of poems assembled from notes by Ernest Fenollosa, such as one in which a woman promises to travel "as far as Cho-fu-sa" to meet her absent husband. The original authors of these poems are bizarrely given Japanese names, despite being Chinese.

ANSWER: **Cathay**

[10] Ezra Pound, the author of *Cathay*, gave the name "Rihaku" to this author of "The River Merchant's Wife: A Letter," a Tang dynasty poet who legendarily drowned trying to embrace the reflection of the moon in the Yangtze River.

ANSWER: **Li** Po [or **Li** Bai]

[10] In this other poem by Li Po in *Cathay*, written as a document to "So-Kin of Rakuho," the speaker reminisces about getting drunk amidst taverns and pavilions with his aforementioned friend, and notes that although all good things come to an end, "there is no end of things in the heart."

ANSWER: "The **Exile's Letter**" [or "**Liuwang de xin**", hopefully]

17. This ruler instituted the Communal Granaries, a bank-like system that loaned seeds to needy farmers, and accepted farm products as interest. For 10 points each:

[10] Name this Portuguese king whose 1578 disappearance at the Battle of Alcacer Quibir fueled legends that he was still alive, plotting to return to the throne some day.

ANSWER: **Sebastian** I [or **Sebastiao** I; or Sebastian the **Desired**; or Sebastian o **Desejado**]

[10] Another casualty at the Battle of Alcazar was this English religious freebooter, a possible illegitimate son of Henry VIII who fought at the Battle of Lepanto and annoyed even Queen Elizabeth with his skill at privateering.

ANSWER: Thomas **Stukley**

[10] The people in this former Portuguese colony, first settled during the reign of Sebastian and leased back to China in 1999, probably don't believe in Sebastianist legends.

ANSWER: **Macau** [or **Macao**; or **Macao** Special Administrative Region of the People's Republic of China; or Regiao Administrativa Especial de **Macau** da Republica Popular da China]

18. Philinnion may have been one of these beings, another of whom gave birth to the lipless boy Akheilios, whom Aphrodite transformed into a shark. For 10 points each:

[10] Name these child-eating succubi from Greek mythology. The most famous one is a Libyan queen whose children were stolen away by Hera, causing her to go mad and tear out her own eyes.

ANSWER: Lamia

[10] Some mythographers claim that Lamia, and not Ceto, was the mother of this monster with four to six dog heads around her waist, who occupied the opposite end of a narrow channel from Charybdis.

ANSWER: Scylla

[10] Lamiae are often grouped with this other species of succubi, who have flaming hair and legs of donkey and brass. Tasked with guarding cross-roads by Hecate, these beings, who are into sleeping men, scare Dionysus and Xanthias on their journey to the underworld in *The Frogs*.

ANSWER: empusae [or empuse]

19. This process was limited by the fact that there is no stable nucleus with a mass number of 5. For 10 points each:

[10] Name this process that occurred in the early universe at temperatures between roughly 1 and 100 gigakelvin. It created the first chemical elements besides hydrogen.

ANSWER: big-bang nucleosynthesis [or BBN; prompt on answers mentioning nuclear fusion; prompt on partial answer]

[10] Big-bang nucleosynthesis was responsible for the production of most of the mass-4 isotope of this element, which makes up about 25% of the matter in the universe.

ANSWER: helium

[10] The two primary parameters governing big-bang nucleosynthesis are the neutron-to-proton abundance ratio and the ratio of baryon density to the density of these particles, which are roughly a billion times more abundant than baryons.

ANSWER: photons

20. Please enjoy the train of thought that led to the following bonus, for 10 points each.

[10] Anthony Bourdain claims to get "something like 50,000 likes in nine minutes" every time he Instagrams a photo of a burger from this Southwestern American fast-food chain whose logo contains a yellow arrow.

ANSWER: In-N-Out Burgers, Inc.

[10] Palm trees are often planted to resemble "X"s in front of In-N-Out Burger locations, in a clear allusion to this 1963 Stanley Kramer film in which the dying words of a thief played by Jimmy Durante send a bunch of strangers played by an ensemble cast including Milton Berle, Mickey Rooney, Ethel Merman, on a race to dig up \$350,000 of stolen cash underneath four palm trees shaped like a "W."

ANSWER: It's a Mad, Mad, Mad, Mad World

[10] *It's a Mad, Mad, Mad, Mad World*, in turn, takes its title from this Jacobean city comedy by Thomas Middleton, whose own ensemble cast includes the knight Sir Bounteous Progress, his steward Gunwater, his grandson's cohort Lieutenant Mawworm, and Master Penitent Brothel, who is in love with the wife of Master Shortrod Harebrain.

ANSWER: A Mad World, My Masters

TB. A woman's son gets executed during her cryptic conversation with her doctor about his impending demise in this collection's story "The Black Veil." For 10 points each:

[10] Identify this collection of vignettes, divided into the sections "Our Parish," "Scenes," "Characters," and "Tales," which examine the ordinary citizens of London. It was published under a pen-name taken from a nasally pronunciation of the author's brother's nickname Moses.

ANSWER: Sketches by Boz [or Sketches by "Boz," *Illustrative of Every-day Life and Every-day People*]

[10] This ghost story by the same author concerns an apparition which covers its eyes with one arm and waves with the other in anticipation of railway catastrophes.

ANSWER: "The Signal-Man"

[10] This author of "The Signal Man" and *Sketches by Boz* wrote a short novel featuring the Ghosts of Christmases Past, Present, and Yet to Come.

ANSWER: Charles Dickens [or Charles John Huffam Dickens]