21. Toni Veikkolainen [vay-koh-"LIE"-nin] determined that these events used to occur about every five million years, but they now occur more often. These events were theorized to exist after observations of an ancient lava flow in France made in the early 20th century by Bernard Brunhes [bair-nar broon-yuh]. The most recent major occurrence of this type is called the Brunhes-Ma·tu·ya·ma event, and the most recent minor one was the Laschamp event. Evidence of these events includes the stripe anomalies where seafloor spreading takes place. Name these polarity changes influenced by changes in the flow of molten iron in the Earth's core.
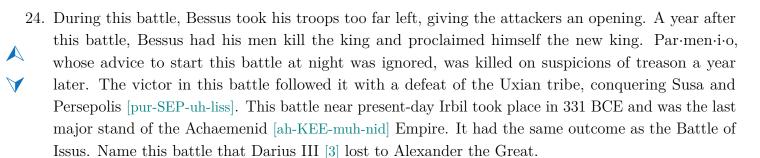
    Answer: <u>geomagnetic reversal</u> [accept any answer referring to <u>reversing</u> of the Earth's <u>magnetic field</u>]

22. In May 2015, this country dug up the remains of its former president Thomas Sankara, whose death had previously been classified as natural when he was killed in a 1987 coup. That coup was led by Blaise Compaoré [kom-por-ay], who led this country until he fled in 2014 following the burning down of many of its government buildings. Compaoré's Regiment of Presidential Security temporarily took control in 2015 and placed General Gilbert Diendéré [zheel-bair dyen-air-ay] in charge. Compaoré was succeeded by Yacouba Isaac Zida [yah-KOO-bah ee-zahk ZEE-dah], Michel Kafando [mee-shel kah-fahn-doh], and Paul Kaba Thieba. The end to this country's 2015 coup was negotiated by the president of neighboring Benin. Name this country whose capital is Ouagadougou [wah-gah-DOO-goo].

    Answer: <u>Burkina Faso</u>

23. This composer's tomb is inscribed with four measures of notes above Italian words that mean "I did not believe you would fade so soon, oh flower", which is taken from one of his arias. In an aria from a different opera by this composer, one of his title characters sings in the duet *Ripeti, o ciel, ripetimi* [ree-PAY-tee, oh chee-"AIL", ree-pay-TEE-mee] at the Temple of Irminsul. That song tells Pollione ["pole"-YOH-nay] that he should stay away from Adalgisa [ah-dahl-JEE-sah]. In another opera, Giorgio [JOR-joh] and Riccardo sing "Suoni la tromba [SWOH-nee lah TROM-bah]", describing the deal they have made over the fates of Arturo and Elvira. Name this composer of the operas *La son·nam·bu·la*, *I puritani*, and *Norma*.

    Answer: Vincenzo <u>Bellini</u> [veen-CHEN-zoh "bail"-LEE-nee] [or Vincenzo (Salvatore Carmelo Francesco) <u>Bellini</u>]

24. During this battle, Bessus took his troops too far left, giving the attackers an opening. A year after this battle, Bessus had his men kill the king and proclaimed himself the new king. Par·men·i·o, whose advice to start this battle at night was ignored, was killed on suspicions of treason a year later. The victor in this battle followed it with a defeat of the Uxian tribe, conquering Susa and Persepolis [pur-SEP-uh-liss]. This battle near present-day Irbil took place in 331 BCE and was the last major stand of the Achaemenid [ah-KEE-muh-nid] Empire. It had the same outcome as the Battle of Issus. Name this battle that Darius III [3] lost to Alexander the Great.

Answer: Battle of Gau·ga·mel·a [or Battle of Arbela]

25. In one play by this writer, a character is introduced as "a thoroughly inhuman human, and a grouch to all". Another of his plays, featuring a suspected affair between Moschion [mohss-KY-ohn] and Gly·ker·a, is *Peri·kei·ro·me·ne*. In another play by this writer, a different Moschion explains how Plan·gon and Chrysis ["crisis"] get pregnant. This writer's best-preserved play opens with Pan describing why Knemon [k'NEE-mahn] is so miserable. Pan then has So·stra·tos fall in love with Knemon's daughter. Name this playwright from the era of Athenian New Comedy who wrote *Samia*—which is also known as *The Girl From Samos*—and *Dyskolos*.
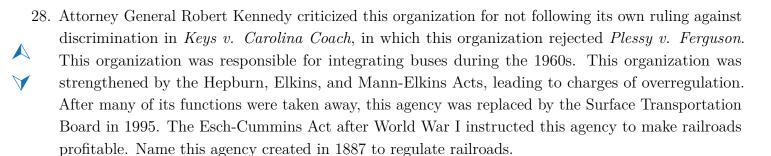
Answer: Menander [men-AN-dur] [or Menandros]

Check the score.

26. The relaxation time named for this person is based on his early model of dielectrics in changing electric fields. The temperature named for this person is multiplied by Boltzmann's constant to calculate phonon [FOH-nahn] energy. This person and Albert Einstein used a phonon model to describe why the law of Dulong and Petit [peh-tee] does not accurately predict specific heats at low temperatures. The unit named for this person, equal to ten to the negative eighteenth statcoulomb-centimeters, is used to measure molecular dipole moments. Identify this Dutch physicist whose name is the length over which electrons screen charges in plasma.

Answer: Peter Debye [duh-BY]

27. The left side of one work by this painter shows Calliope [kuh-"LIE"-oh-pee] standing with her legs crossed, and the center shows Apollo sitting and pointing to paper. Another work by this painter depicts a widow in Ancient Greece gathering the ashes of her husband. In addition to *The Inspiration of the Poet* and *Landscape with the Ashes of Phocion [FOH-shee-un]*, this artist made two sets of paintings about the seven sacraments. Another one of this artist's paintings takes its name from the inscription on a tomb that three shepherds are studying. Another work shows a chariot cross the sky while four women dance with their backs facing the inside of their circle. Name this French artist of *Et in Arcadia ego* and *A Dance to the Music of Time*.

Answer: Nicolas Poussin [nee-koh-lah poo-san]

28. Attorney General Robert Kennedy criticized this organization for not following its own ruling against discrimination in *Keys v. Carolina Coach*, in which this organization rejected *Plessy v. Ferguson*. This organization was responsible for integrating buses during the 1960s. This organization was strengthened by the Hepburn, Elkins, and Mann-Elkins Acts, leading to charges of overregulation. After many of its functions were taken away, this agency was replaced by the Surface Transportation Board in 1995. The Esch-Cummins Act after World War I instructed this agency to make railroads profitable. Name this agency created in 1887 to regulate railroads.

Answer: Interstate Commerce Commission [or ICC]

29. According to a story in the Vedas [VAY-duz], a holy person taught this concept to a snake who was later found bruised. In the U·pa·ni·shads, this concept is the first yama, leading many teachers to claim that it is the key to yoga. Satya·graha, the insistence on truth developed by Gandhi, was often connected to this concept, and Gandhi said that this concept and truth were two sides of the same coin. Some people wear masks over their mouth and nose to follow this principle, and some people avoid eating root vegetables while being vegetarians. Name this principle practiced in several religions, a central tenet of Jainism, that is based on not harming any living thing.

Answer: ahimsa [prompt on noninjury or nonviolence]

30. This writer relayed a story his father told him about a man who kills an outsider while talking nonchalantly to his wife. That story is in this writer's essay collection *The Man Made of Words*. One of this writer's works is about a journey leading to a knoll near the Wichita Range in Oklahoma. That work, written after the death of this author's grandmother, is based on oral folklore. In another novel by this person, a World War II veteran moves to Los Angeles after serving time for killing Juan Reyes. That person cares for his grandfather Francisco in New Mexico. Name this Kiowa [KY-oh-wuh] author of *The Way to Rainy Mountain* and *House Made of Dawn*.

Answer: N(avarre) Scott Momaday

Check the score.

31. The calcific [kal-SIF-ik] inflammation of these objects is most common in the example of them located between the supra·spinatus [SOO-prah-spy-NAY-tus] tendon and the acromion [ah-KROH-mee-ahn]. That example of this structure is located in the shoulder and called sub·acromial [SUB-uh-KROH-mee-ul]. Temporary examples of these objects can cause foot pain known as meta·tarsalgia [MET-uh-tar-SAAL-jee-uh] and are classified as adventitious. Swelling in front of the knee is a symptom of the inflammation of the pre·patellar example. In birds, the B cells are produced in a specialized example of this organ. Name these sacs containing synovial fluid, one example of which is named Fabricius.

Answer: synovial bursae

32. This man fathered two children with Joan Larke. He established Cardinal's College at Oxford, which later became Christ Church. This statesman organized a secret treaty with Spain, the Treaty of Bruges [broozh], which undermined his own work to bring European peace through the Treaty of London. This person also arranged the extravagant meeting between Francis I [1] of France and Henry VIII [8] at the Field of the Cloth of Gold. He was about to be charged with treason when he died, having fallen out of favor for failing to get Pope Clement VII [7] to annul the marriage of Catherine of Aragon and Henry VIII [8]. Name this predecessor of Thomas More as Lord Chancellor of Great Britain.

Answer: (Cardinal) Thomas Wolsey

33. The southwest side of this city has two artificial lakes, Hi·ma·yat Sagar and Osman Sagar. Those lakes are much more recent than Hussain Sagar, which is next to Lumbini Park. All of those lakes in this city are fed by the Musi River. This city was headed by nizams, many of whom lived in Chow·ma·halla Palace near the Mecca Masjid. The capital of the new state Telan·gana, this city is still also the capital of Andhra Pradesh even though it is no longer in that state. This city contains a mosque known for its four grand arches and minarests, the Char·minar. Name this "City of Pearls", located north of Bangalore and east of Mumbai.

Answer: Hyderabad ["high-DARE"-uh-bahd], India

34. This poet wrote "I choose what once I chose" in "All Heaven Is Blazing". Another poem by this writer is about a relative "who lurked to spy and peer"; that relative, who caused the death of the narrator's lover, is "Sister Maude". This poet wrote "Hap[pi]ly I may remember, And hap[pi]ly may forget" at the end of her poem "When I am dead, my dearest". Another poem by this writer is about two sisters who are tempted by strange creatures to buy fruit; Laura pays for the fruit with a lock of hair. Like her siblings, this writer was part of the Pre-Raphaelite Brotherhood. Name this poet whose *Goblin Market* was illustrated by her brother Dante Gabriel.

Answer: Christina (Georgina) Rossetti [prompt on Rossetti]

35. The Hückel method approximates molecular orbitals for molecules with this property. Molecules with this property can be modeled as a particle in a box with a length equal to the molecule's length. The Woodward-Fieser [FY-zer] rules are used to predict the peak absorbances of compounds with this property, which are commonly present in color-generating chromophores. Di·enes ["DIE"-eenz] with this property have two possible addition products, which is why Gilman reagents are used in those additions. Systems that satisfy Hückel's rule, are planar, contain a ring, and have this property are aromatic, thus exhibiting resonance. Name this property describing regions of a molecule with delocalized pi systems, which is depicted as alternating single and double bonds.

Answer: conjugation or conjugated molecules [accept answers referring to delocalized pi bonds or delocalized pi systems before "delocalized"; prompt on resonance before it is mentioned]

Check the score.

36. This composer's last orchestral work was premiered with support from Raoul Gunsbourg and René Fauchois [foh-shwa], was commissioned by Albert I [1] of Monaco, and referenced his own *Le plus doux chemin*. Maurice Ravel wrote a berceuse ["bear-sues"] for this composer, and this composer followed his own berceuse with a section called "Mi-a-ou" in a piece for his mistress' daughter. This student of Camille Saint-Saëns [kaa-meel san-sahnss] and teacher of Maurice Ravel composed *Masques et bergamasques [mahsks ay bair-gah-mahsks]* and *Dolly*. Before Claude Debussy [day-byoo-see], this composer wrote a piece based on Verlaine's "Clair de Lune". Name this French composer whose *Requiem* in D minor, containing a particularly famous *Pie Jesu [pee-ay YAY-soo]*, was played at his 1924 funeral.

Answer: Gabriel <u>Fauré</u>

37. This person wrote that "history is together freedom and necessity" in the essay "The Conquest of the State". This person stated that all people are intellectuals, but only some people play the role of an intellectual in society. His essay "The Revolution against *Das Kapital*" pointed out the discrepancies between the October Revolution and Marxism. This thinker wrote a letter to Stalin about Trotsky that was never delivered. This person explained how ruling class ideas become dominant using the concept of cultural hegemony. This writer was arrested in 1926 after an assassination attempt on Mussolini. Name this Italian Marxist who wrote the *Prison Notebooks*.
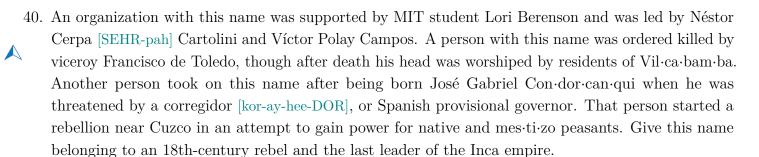
Answer: Antonio <u>Gramsci</u> [GRAHM-shee]

38. Because two women in this novel do not want to toss a coin on a Sunday, they decide which person to send a valentine to by tossing a Bible to see if it lands open or closed. Because of that toss, Teddy Coggan does not receive the valentine whose seal reads "Marry me." One of the characters in this novel, who is saved from dying of smoke inhalation, changes professions from a shepherd to a bailiff when he moves to Weatherbury. That character eventually marries the woman who turns down offers from Sergeant Troy and William Boldwood. Name this Thomas Hardy novel about Gabriel Oak and Bathsheba Everdene.

Answer: *<u>Far from the Madding Crowd</u>*

39. Fermat's little theorem can be used to prove that no numbers are in both a set named for Arthur Wieferich [AR-toor VEE-fair-ik] and this set. One method to determine whether a number is in this set starts with 4, then repeatedly squares the result and subtracts 2; if at a certain point that procedure leaves a residue of zero, the number is one of these numbers. That procedure is called the Lucas-Lehmer [loo-KAH LAY-mur] test. These numbers are in one-to-one correspondence with the perfect numbers, and exactly 48 of them are currently known. These numbers are one less than a prime power of two and are also themselves prime. Identify this set of prime numbers named for a 17th-century French monk.

Answer: <u>Mersenne prime</u>s [prompt on <u>prime</u> numbers or <u>primes</u> between "starts with 4" and "perfect"; do not accept or prompt on "Mersenne number(s)"; accept just <u>Mersenne</u> after "themselves prime" and prompt on it before that]

40. An organization with this name was supported by MIT student Lori Berenson and was led by Néstor Cerpa [SEHR-pah] Cartolini and Víctor Polay Campos. A person with this name was ordered killed by viceroy Francisco de Toledo, though after death his head was worshiped by residents of Vil·ca·bam·ba. Another person took on this name after being born José Gabriel Con·dor·can·qui when he was threatened by a corregidor [kor-ay-hee-DOR], or Spanish provisional governor. That person started a rebellion near Cuzco in an attempt to gain power for native and mes·ti·zo peasants. Give this name belonging to an 18th-century rebel and the last leader of the Inca empire.

Answer: Túpac <u>Amaru</u>

This is the end of the packet.