QQBC Packet 4

1. **In a novel by this author, a former crew member of the British destroyer Wildebeest struggles to survive North Atlantic waters before finding himself on a barren rock. This author of Pincher Martin also wrote a novel in which the corpse of a parachutist alarms the twins (\*)** Sam and Eric, who mistake the body for a “beast.” For 10 points—what author wrote about the murder of an asthmatic boy called Piggy in Lord of the Flies?  
  
 answer: William (Gerald) Golding  
  
 <LIT, BRIT>

8. In 2016, scientists reported observing the ”burping” of this kind of object in the Messier [“mess”-yay] 51 galaxy system. For 10 points each—  
  
 A. Name this type of body, which Stephen Hawking predicted must emit a mass-reducing form of radiation.  
  
 answer: (supermassive) black hole(s)  
  
 B. A supermassive black hole can be found in this large spiral galaxy. By diameter, this is the largest known galaxy in the Local Group, and the nearest to us.  
  
 answer: Andromeda galaxy (accept M31 or Messier 31 or NGC 224 or New General Catalogue 224)  
  
 C. This astronomer names the radius that defines the sphere such that if an object's mass were compressed into that sphere, it would form a black hole since the escape velocity of the object would be greater than the speed of light.  
  
 answer: Karl Schwarzschild (accept Scharwarzschild radius)  
  
 <SCI, OTHER>

2. **Since 2012 this sea's Artillery Bay has housed a combat dolphin training center. It's not the Caspian, but zebra mussels are native to this sea, which contains many well-preserved shipwrecks because it is 90 percent anoxic. The naval base of Varna is on this sea, as are the former Soviet naval bases of (\*)** Odessa and Sevastopol [suh-VAS-tuh-pohl]. The Bosphorus [“BOSS”-puh-russ] is southwest of—for 10 points—what colorfully named sea south of Ukraine?  
  
 answer: Black Sea  
  
 <GEO, GEO>

7. A fashionable women's club called the “Jolly Seventeen” organizes weekly bridge games in this novel. For 10 points each—  
  
 A. Name this novel in which Carol Kennicott comes to terms with life in Gopher Prairie.  
  
 answer: Main Street  
  
 B. This author of Main Street based Gopher Prairie on his hometown of Sauk Centre, Minnesota. He would later decline a Pulitzer [“PULL-it-sir”] Prize for his satire of the medical profession, Arrowsmith.  
  
 answer: (Harry) Sinclair Lewis  
  
 C. This Lewis novel depicts a hypocritical businessman from Zenith, whose only respite is camping in Maine with Paul Riesling.  
  
 answer: Babbitt  
  
 <LIT, AMER>

3. **A St. Paul police officer urged people to run over members of this movement in a Facebook post. In January 2016 people affiliated with this movement blocked traffic on San Francisco's Bay Bridge. A member of this movement used the sign “16 (\*)** Shots and a Cover-up” at a U.S. Conference of Mayors meeting, referencing Laquan McDonald. For 10 points—name this movement formed in response to shootings of African-Americans.  
  
 answer: Black Lives Matter (accept #BlackLivesMatter)  
  
 <CE, CE>

8. Nerves relay pain, but sometimes they cause pain too. For 10 points each—  
  
 A. This childhood disease can manifest as shingles in adults, causing excruciating pain, typically along a single nerve.  
  
 answer: chickenpox (or varicella; prompt on “zoster”)  
  
 B. Pain radiates downward from the back to the leg in a condition named for the longest nerve in the body. Name either the condition or the nerve.  
  
 answer: sciatica [sye-AA-tih-kuh] or sciatic [sye-AA-tik] nerve  
  
 C. Thumb side of the palm and most of the flexors in the arm are innervated by this nerve. Carpal tunnel syndrome is the compression of the wrist portion of this nerve.  
  
 answer: median nerve (do not accept or prompt on “medial (nerve)”)  
  
 <SCI, BIO>

4. **In 1928 an attempt to harvest this resource began in the Brazilian town of Fordlandia. A photograph shows a man looking at his daughter's hand, which was cut off by the Force Publique for failing to produce this resource in the Congo. The name (\*)** “Olmec” refers to this resource, which can be strengthened by adding sulfur in a method discovered by Charles Goodyear. For 10 points—name this substance which can be vulcanized.  
  
 answer: (natural) rubber (accept Indian rubber or caoutchouc or latex or isoprene)  
  
 <HIST, OTHER>

5. Despite the game's long history, prior to about 2005 there was surprising unanimity on the identity of baseball's “best player ever.” For 10 points each—  
  
 A. Nearly every survey or list placed this Yankees outfielder in the #1 slot; his .690 [“six hundred ninety”] slugging percentage remains a career record.  
  
 answer: Babe Ruth (or George Herman Ruth Jr.)  
  
 B. Some consider this former Pirates and Giants slugger, who hit a record 762 career home runs, to be the best player of all time, despite a performance enhancing drug scandal surrounding him.  
  
 answer: Barry (Lamar) Bonds  
  
 C. Craig Wright's The Diamond Appraised gave the honor to this shortstop for the Pittsburgh Pirates; he was among the five inaugural inductees into the Hall of Fame.  
  
 answer: Honus Wagner (or Johannes Peter Wagner)  
  
 <TRASH, SPORTS>

5. **After molecular hydrogen, this compound is the most abundant molecule in the universe. In the water-gas shift reaction, this compound reacts with water to yield hydrogen gas and carbon dioxide. This diatomic [“dye-atomic”] gas binds to (\*)** hemoglobin 200 times more tightly than oxygen, which is why homes often have detectors for it. For 10 points—name this colorless, odorless, poisonous gas whose formula is CO [“C-O”].  
  
 answer: carbon monoxide (accept CO before “CO”)  
  
 <SCI, CHEM>

3. In December 2015 this company bought the English-language South China Morning Post newspaper. For 10 points each—  
  
 A. Name this e-commerce company founded by Jack Ma.  
  
 answer: Alibaba (Group Holding Ltd.)  
  
 B. The South China Morning Post is published in this former British colony, located across the Pearl River delta from Macau.  
  
 answer: Hong Kong (or Hong Kong Special Administrative Region or Xianggang Tebie Xingzhengqu)  
  
 C. In 2014 Alibaba raised 25 billion dollars in the largest ever of these events, the first time a stock is made available for market purchase.  
  
 answer: IPO or initial public offering  
  
 <CE, CE>

6. **A gold coin from this empire depicted a four-horse chariot carrying the holy stone of the Emesa temple. This empire's ruler Elagabalus [eh-luh-GAB-uh-luss] briefly installed himself as the high priest of Sol Invictus, or the “Undefeated Sun,” who was celebrated in the (\*)** Saturnalia festival. A sacred eternal flame in its capital was maintained by the Vestal Virgins. For 10 points—name this empire whose high priest was the Pontifex Maximus [PAHN-tih-feks MAK-sih-muss].  
  
 answer: Roman Empire or Ancient Rome (or Imperium Romanum or Roma)  
  
 <HIST, OTHER>

9. Draw two concentric circles, and fill in the area between them. For 10 points each—  
  
 A. This is the name for the resulting shape.  
  
 answer: annulus (or annular shape; accept annuli; prompt on “ring”)  
  
 B. If the smaller circle has a radius measuring lowercase r, and the larger circle has a radius measuring capital R, what is the area of the annulus? Be sure to specify the case of each 'R' in your answer.  
  
 answer: pi (R2 - r2) [“pi times the quantity uppercase R squared minus lowercase r squared”] or pi R2 – pi r2 [“pi (times) uppercase R squared minus pi (times) lowercase r squared”] (accept synonymous for case-specifying adjectives, like “capital” for “uppercase”)  
  
 C. Solids similar to annuli—as if they were slightly thickened in a direction perpendicular to the plane they lie in—are the fundamental pieces in this specific method for finding the volume of a solid of revolution in calculus.  
  
 answer: integration by washers (or washer integration; do not accept or prompt on answers containing “shell” or “disk”)  
  
 <SCI, OTHER>

7. **The Morse Museum's collection of this artist's works includes his chapel interior for the 1893 World's Columbian Exposition. This artist used the term Favrile [fahv-REEL] to describe his blown and shaped works, while many of his leaded works display a dragonfly or floral motif. Tree of Life was the last (\*)** window this artist designed. Stained glass was a medium of—for 10 points—what Art Nouveau [art noo-VOH] designer of namesake lamps?  
  
 answer: Louis (Comfort) Tiffany (accept Tiffany lamps after “lamps”)  
  
 <FA, OTHER>

3. It was founded by a one-time Unitarian minister named George Ripley. For 10 points each—  
  
 A. Name this attempt at communal living in West Roxbury, Massachusetts that briefly flourished during the 1840s.  
  
 answer: Brook Farm (accept Brook Farm Institute of Agriculture and Education)  
  
 B. Ripley served as an editor of The Dial, a leading magazine of this American philosophical movement, whose members include Margaret Fuller and the author of “Self-Reliance.”  
  
 answer: Transcendentalism (accept forms such as Transcendentalist)  
  
 C. During the 1840s, Massachusetts was also home to a utopian commune known as Fruitlands, which was founded by the father of this author of Little Women.  
  
 answer: Louisa May Alcott [It was founded by her father, Bronson Alcott.]  
  
 <LIT, AMER>

8. **This property of all slopes of lines connecting data points can be found using the Theil-Sen [“tail”-sen] estimator. The line in the middle of a box plot represents this value. When there are an even number of data points, computing this value involves taking the (\*)** average of two of them, while for an odd number of data points it is a single one of them. For 10 points—name this value that is in the middle of a data set.  
  
 answer: median (accept second quartile or fifth decile or 50th percentile)  
  
 <SCI, OTHER>

2. This painting's creator later claimed its title referred to the French city that was home to Max Jacob's grandmother, rather than to a street name. For 10 points each—  
  
 A. Name this Pablo Picasso painting depicting five prostitutes in a Barcelona brothel.  
  
 answer: Les Demoiselles d'Avignon [lay dem-wah-ZELL dah-veen-YAHN] (or The Young Ladies of Avignon)  
  
 B. Les Demoiselles d'Avignon was an early work in this art style that Picasso pioneered, in which objects are depicted from multiple angles at once.  
  
 answer: Cubism (accept Cubist and other forms; accept Proto-Cubism)  
  
 C. The term “Cubism” derived from Louis Vauxcelles' [loo-EE voh-SELLZ'Z] criticism of this other painter's Houses at l'Estaque [leh-“STOCK”].  
  
 answer: Georges Braque [zhorzh brahk]  
  
 <FA, VISUAL>

9. **In a test of this effect, John Darley and Bibb Latané measured how long it took for people filling out a questionnaire to notice smoke being pumped into a room. An oft-cited article about how 38 people witnessed the murder of Kitty (\*)** Genovese is often used as an example of this effect, in which there is a diffusion of responsibility. For 10 points—name this effect in which onlookers fail to respond to an emergency.  
  
 answer: bystander effect (accept Genovese Syndrome before “Genovese”)  
  
 <RMPSS, SOC SCI>

4. This playwright stated “one must never place a loaded rifle on the stage if it isn't going to go off.” For 10 points each—  
  
 A. Name this Russian writer whose namesake “gun” is the principle that a foreshadowed event must eventually come to pass.  
  
 answer: Anton (Pavlovich) Chekhov (accept Chekhov's gun or Chekhov's rifle)  
  
 B. At the end of Act III, the title character of this Chekhov play shoots—but fails to hit—the retired Professor Serebryakov [SAIR-ee-BREE-kawf].  
  
 answer: Uncle Vanya (or Dyadya Vanya)  
  
 C. In this Chekhov play, Konstantin's attempts to kill himself are foreshadowed when he shoots the title bird.  
  
 answer: The Seagull (or Chayka)  
  
 <LIT, EURO>

10. **In January 2016 Sri Lankan officials destroyed 3 million dollars' worth of this material and apologized for its procurement. That same month, Yahoo's Japanese offices were criticized for profiting from auctions of this material, which some conservationists stain pink or other colors besides (\*)** white to dissuade hunters from killing the animals that provide it. For 10 points—name this material poached from elephants.  
  
 answer: ivory (prompt on ”(elephant) tusk(s)”)  
  
 <CE, CE>

2. Pelopidas [puh-LAH-puh-duss] was the leader of this elite infantry unit, which defeated a larger Spartan force at Tegyra [teh-“GEAR”-uh]. For 10 points each—  
  
 A. Name this group of 150 pairs of Theban [THEE-bin] soldiers, which routed the Spartans at the Battle of Leuctra [LOOK-truh].  
  
 answer: Sacred Band of Thebes (or Hieros Lokhos)  
  
 B. This man defeated the Thebans and destroyed the Sacred Band at the 338 Battle of Chaeronea [“care”-uh-NEE-uh]. Two years later he was assassinated by Pausanias of Orestis at the wedding of this man's daughter by Olympias.  
  
 answer: Philip II of Macedon (pompt on “Philip (of Macedon)”)  
  
 C. Part of the Macedonians' [MAA-suh-DOH-nee-unz] success at Chaeronea has been attributed to their use of the sarissa, one of these melee weapons. The pike is a variant of this simple weapon with a longer shaft.  
  
 answer: spears (do not accept or prompt on “lance” or “javelin”)  
  
 <HIST, OTHER>

11. **The prelude of one of this composer's operas consists only of E-flat chords. In one of his operas, the sword Nothung [NOH-tung] is shattered, allowing Hunding to stab the hero. His music is celebrated at the Bayreuth [bye-royt] Festival. In one of his operas, a circle of fire is traversed by (\*)** Siegfried to free Brünnhilde [broon-“HILL”-duh]. For 10 points—name this composer who included “The Ride of the Valkyries” in his opera cycle The Ring of the Nibelungen.  
  
 answer: (Wilhelm) Richard Wagner [REEK-“heart” VAHG-nur]  
  
 <FA, AUDIO>

4. This peninsula's namesake national park contains one of the few temperate rain forests in the continental U.S. For 10 points each—  
  
 A. Name this mountainous, forested peninsula that is south of the Strait of Juan de Fuca [WAHN deh FOO-kuh] and west of the Puget Sound.  
  
 answer: Olympic Peninsula (accept Olympic National Park)  
  
 B. The Olympic Peninsula lies across the Puget [PYOO-jet] Sound from this major port city, the most populous in the state of Washington.  
  
 answer: Seattle, Washington  
  
 C. Olympic National Park houses a large herd of the Roosevelt variety of these horned mammals, among the largest deer species in the U.S. There exists debate over how this species is related to the similar Eurasian red deer.  
  
 answer: elk (accept Roosevelt elk)  
  
 <GEO, GEO>

12. **In one poem, this author described an experience that caused him to feel like “some watcher of the skies” seeing a new planet, or “like stout Cortez” looking at the Pacific Ocean. This author of the sonnet “On First Looking into Chapman's Homer” asked “what leaf-fring'd legend haunts about thy shape” in a poem that declares (\*)** “beauty is truth, truth beauty.” For 10 points—name this British poet who wrote “Ode on a Grecian Urn.”  
  
 answer: John Keats  
  
 <LIT, BRIT>

7. In 1782 this man's government was disrupted by the rise of the Rockingham Whigs. For 10 points each—  
  
 A. Name this British monarch who ruled during the American Revolution.  
  
 answer: George III of the United Kingdom (prompt on “George”)  
  
 B. The Rockingham Whigs ended the twelve-year service of this British prime minister, who was widely blamed for the loss of America.  
  
 answer: Lord North (or Frederick North, 2nd Earl of Guilford)  
  
 C. George III, like his great-grandfather George I, belonged to this German Protestant dynasty.  
  
 answer: House of Hanover (or Hanoverians or Hanoverian dynasty)  
  
 <HIST, EURO>

13. **In this war, the village of Lidice [LEE-deet-suh] was massacred as retribution for an assassination committed by two Czech [“check”] soldiers. Early in this war, over 20,000 soldiers and intellectuals were shot at Katyn Forest. In this war's Babi Yar [BAH-bee YAR] Massacre, over 30,000 civilians were shot in a ravine outside Kiev by the (\*)** Einsatzgruppen [EYNE-zahtz-GROO-pen]. The Dachau [dah-“COW”] and Treblinka camps were built during—for 10 points—what war that witnessed the Holocaust?  
  
 answer: World War II or World War Two (or Second World War)  
  
 <HIST, EURO>

2. The price of this commodity hit a twelve-year low, below $28 per barrel, in January 2016. For 10 points each—  
  
 A. Name this natural resource. Many nations that export it are members of OPEC [oh-“peck”].  
  
 answer: crude oil or petroleum [OPEC stands for Organization of the Petroleum Exporting Countries.]  
  
 B. Due to the falling price of oil, this nation led by Sheikh Khalifa removed fuel subsidies in 2015. It is currently the second-largest oil producer in OPEC, after Saudi Arabia.  
  
 answer: United Arab Emirates or UAE (or al-Imarat al-Arabiyah al-Muttahidah)  
  
 C. Falling oil prices are forecast to cause this economic condition in Venezuela, in which a massive rise in both prices and money supply causes an extreme devaluation of currency. Zimbabwe experienced this phenomenon in the 2000s.  
  
 answer: hyperinflation (prompt on “inflation”)  
  
 <CE, CE>

14. **This country was the birthplace of stained glass artist John La Farge. A copper Diana and a bronze relief war memorial were designed in it by Augustus Saint-Gaudens [“saint” GAW-dunz]. An artist from here painted A Dash for the Timber and showed a man atop a rearing (\*)** horse in his sculpture Bronco Buster. For 10 points—name this nation of Frederic Remington, the location of Gutzon Borglum's massive carving of four heads on Mount Rushmore.  
  
 answer: United States of America or U.S.A. (accept any underlined portion)  
  
 <FA, OTHER>

5. This economist said that “inflation is always and everywhere a monetary phenomenon.” For 10 points each—  
  
 A. Name this libertarian economist who championed monetarism and wrote the book Capitalism and Freedom.  
  
 answer: Milton Friedman  
  
 B. Friedman worked with other economists to devise the “withholding” system for collecting this source of government revenue, which is subject to many “deductions.”  
  
 answer: (U.S.) income tax(es) (prompt on “tax(es)”)  
  
 C. In 1968 Friedman criticized this curve that suggested that there was an inverse relationship between unemployment and inflation in an economy.  
  
 answer: Phillips curve  
  
 <RMPSS, SOC SCI>

15. **Pictures of this character are used to cover an office plaque so that it reads “Do it for her.” This character was briefly voiced by Elizabeth Taylor and is the rival of Gerald, a unibrowed character of a similar age. After both her father and Waylon (\*)** Smithers incorrectly claim to have done so, it is revealed that this character shot Mr. Burns. For 10 points—name this pacifier-sucking daughter of Marge and Homer Simpson.  
  
 answer: Maggie Simpson (or Margaret Evelyn Simpson; prompt on “Simpson”) [The plaque, which Mr. Burns placed above Homer's workstation, originally read “Don't forget: You're here forever.”]  
  
 <TRASH, POP CULT>

7. For 10 points each—answer the following about the NBA three-point shootout:  
  
 A. This Chicago Bull set the record for the lowest score in a round when he only scored five points in 1990. He won the 1987 and 1988 dunk contests.  
  
 answer: Michael (Jeffrey) Jordan  
  
 B. This Boston Celtic won the first three competitions. He won three NBA titles with Boston as a player before going on to coach the Indiana Pacers.  
  
 answer: Larry (Joe) Bird  
  
 C. The 2013 champion was this player for the Cleveland Cavaliers, who in 2012 won Rookie of the Year.  
  
 answer: Kyrie (Andrew) Irving  
  
 <TRASH, SPORTS>

16. **The children of King Pierus [PEER-uss] of Macedon [MASS-ih-don] were named after these characters. Thamyris [THAM-uh-riss] was blinded after a competition with this group, who also judged the contest that resulted in Marsyas [mar-“SIGH”-uss] being flayed. Linus and Orpheus [OR-fee-uss] are the sons of a member of this group, who themselves are the daughters of Zeus and (\*)** Mnemosyne [neh-MAH-sin-ee]. Calliope and Clio are members of—for 10 points—what set of nine Greek goddesses of literature and the arts?  
  
 answer: Muses (or Mousai)  
  
 <RMPSS, MYTH>

7. For 10 points each—name these 19th-century novels that describe the Battle of Waterloo:  
  
 A. Fabrizio [fah-BREED-zee-oh] del Dongo wanders on to the battlefield of Waterloo at the beginning of this novel by Stendhal [stawn-DAHL].  
  
 answer: The Charterhouse of Parma (or La Chartreuse de Parme)  
  
 B. 19 chapters of this Victor Hugo novel are devoted to Waterloo, where Thénardier [tay-nard-YAY] has a chance meeting with Colonel Pontmercy [“pawn-mare-SEE”].  
  
 answer: Les Misérables [lay mee-zay-RAHB] (or The Miserable Ones or The Wretched Poor; do not accept or prompt on “Les Miz”)  
  
 C. George Osborne dies at Waterloo after propositioning Becky Sharp in this novel by William Makepeace Thackeray.  
  
 answer: Vanity Fair (or Vanity Fair: A Novel without a Hero)  
  
 <LIT, EURO>

17. **A Salvador Dalí work is titled for a “burning” one of these animals. In 1414 Malindi ambassadors gave one of these animals to Zheng He [zhung huh], who took it back to China. Tanzania's national animal is this ungulate, which Jean-Baptiste Lamarck claimed developed its best-known feature due to repetitive (\*)** reaching for leaves on increasingly tall Acacia [uh-KAY-shuh] trees. For 10 points—name these African herbivores with very long necks.  
  
 answer: giraffes (or Giraffa or Giraffa camelopardalis; accept The Burning Giraffe)  
  
 <MISC., MISC.>

5. If a polynomial's degree is this number, it is called quartic [“QUART”-ik]. For 10 points each—  
  
 A. Give this number. It is also the highest degree for which a single-variable polynomial can always be solved in terms of radicals.  
  
 answer: 4 (accept fourth-degree or degree four)  
  
 B. According to the Stefan-Boltzmann [STEH-fahn BOLTS-min] law, the amount of energy a black body releases is proportional to the fourth power of this quantity, and its maximum wavelength is inversely proportional to it.  
  
 answer: (absolute) temperature  
  
 C. This measure of the “tailedness” or “peakedness” of a probability distribution is the fourth moment about the mean divided by sigma to the fourth power.  
  
 answer: kurtosis [kur-TOH-siss]  
  
 <SCI, OTHER>

18. **In one of this man's books, John travels from Puritania to an island that he saw in a vision. This author of The Pilgrim's Regress wrote about Elwin Ransom's visit to Mars in Out of the Silent Planet, the first book in his “Space Trilogy.” He is better known for a series of seven novels, the last of which features an ape named (\*)** Shift. The Last Battle is the final book in—for 10 points—what author's Chronicles of Narnia?  
  
 answer: C. S. Lewis (or Clive Staples Lewis)  
  
 <LIT, BRIT>

7. This nation's head of state is known as the Druk Gyalpo [DROOK g'YAL-poh], or “dragon king.” For 10 points each—  
  
 A. Name this mountainous Himalayan nation that lies east of Nepal.  
  
 answer: (Kingdom of) Bhutan [boo-TAHN] (or Druk Yul or Druk Gyalkhap)  
  
 B. Bhutan lies south of this disputed Chinese region in the Himalayas, which was traditionally ruled by the Dalai Lama [DAH-“lie” LAH-muh].  
  
 answer: Tibet (or Bod or Xizang [shee-zahng] (Autonomous Region))  
  
 C. The current dragon king, Jigme Wangchuck [JIG-mee WAHNG-chook], rules from this capital of Bhutan.  
  
 answer: Thimphu [tim-POO]  
  
<GEO, GEO>

19. **Different values for this property in alcohol and water cause a phenomenon called tears of wine. The capillary pressure difference caused by this property can be calculated using the Young-Laplace [luh-PLAHSS] equation. Many (\*)** detergents reduce this property; the general name for substances that do so includes the phrase “active agents.” For 10 points—name this phenomenon of fluids that allows some insects to ”walk on water.”  
  
 answer: surface tension (prompt on “surface energy”; do not accept or prompt on “surface” or “energy”) [Substances that reduce surface tension are called surface active agents, or surfactants.]  
  
 <SCI, CHEM>

8. Niles Eldredge's study of these marine animals helped inspire the theory of punctuated equilibrium. For 10 points each—  
  
 A. Identify this class of extinct creatures named for their three-sectioned bodies.  
  
 answer: trilobites [“TRY”-loh-“bites”] (or Trilobita)  
  
 B. Trilobites were members of this phylum, which also includes crustaceans and insects.  
  
 answer: arthropods [AR-thruh-“pods”] (or Arthropoda)  
  
 C. Trilobites went extinct about 250 million years ago, at the end of this final period of the Paleozoic [pay-lee-uh-ZOH-ick] Era.  
  
 answer: Permian Period  
  
 <SCI, BIO>