QQBC Packet 9

1.  **Arthur Scargill led a 1984 strike of workers in this industry, which Britain had nationalized in 1947. Margaret Thatcher’s victory over those strikers preceded a sharp downturn in this industry, which unofficially ceased in the UK in 2015. With (\*)** steel, this good names a community that normalized competition for resources within Europe and inspired the later European Union. For ten points, name this commodity whose anthracite form is commonly mined as a fuel source.  
  
ANSWER: coal (accept coal mining; accept European Coal and Steel Community; prompt on “mining;” prompt on “ECSC”)  
  
<HIST, BRIT>

This seer was struck blind for mediating a dispute between Hera and Zeus over the difference in experiences of men and women. For ten points each,  
  
[10] Name this prophetic man from Greek myth, who had spent seven years as a woman after Hera caught him striking a pair of snakes.  
  
ANSWER: Tiresias  
  
[10] Like Tiresias, this mythological woman was both a prophet and cursed by the gods. This Trojan princess was cursed by Apollo to make accurate predictions, but never to be believed.  
  
ANSWER: Cassandra  
  
[10] This historical Greek position was held by a series of priestesses sat on a three-legged stool in their role as this oracle. This oracle may have been “inspired” by toxic gasses that rose through a fissure under the Temple of Apollo.  
  
ANSWER: Pythias (accept Oracle at Delphi)  
  
<RMPSS, MYTH>

2.  **The Davisson-Germer experiment scattered these entities, proving their wave-particle duality. The charge-to-mass ratio of these leptons were measured in a cathode ray tube by (\*)** J.J. Thomson, and their charge was calculated in the oil drop experiment by Robert Millikan. For 10 points, name this subatomic particle with charge opposite that of a proton, found orbiting the nucleus of the atom.   
  
Answer: electrons   
  
<SCI, PHYS>

For ten points each, answer the following about the rock label Fueled by Ramen.  
  
Fueled by Ramen is distributed by Atlantic Records, who signed this Hayley Williams-fronted band in 2005, but gave them to Ramen for PR purposes. This band’s self-titled 2013 album includes “Still Into You.”  
  
ANSWER: Paramore  
  
This band’s self-released Regional at Best album caught the attention of numerous labels; they signed with Ramen in 2012 and released singles like “Tear in My Heart” and the ubiquitous “Stressed Out” from their album, Blurryface.  
  
ANSWER: Twenty One Pilots  
  
Ramen artist The Front Bottoms released a 2010 music video for a song about one of these objects “on the wall of my room. These objects also title a song in which Karen O sings “Wait! They don’t love you like I love you.”  
  
ANSWER: Maps   
  
<TRASH, POP CULT>

3.  **A piece of this material that "has no earthly business in a Maine hayfield" hides a letter from Andy to Red in The Shawshank Redemption. After his foot was eaten, Tezcatlipoca replaced it with a mirror made of this material. This material, formed when flowing (\*)** water meets a lava source block, can be used to construct a Nether Portal in Minecraft. For 10 points, name this rock, which forms from rapidly cooling lava into a black, shiny volcanic glass.   
  
Answer: obsidian (prompt on “volcanic glass” before mentioned)   
  
<TRASH, POP CULT>

For 10 points each, give the following about Nikolai Rimsky-Korsakov.   
  
[10] A short piece by Rimsky-Korsakov features runs of sixteenth notes on violin or flute to depict the "Flight of" this stinging insect.   
  
Answer: Flight of the Bumblebee   
  
[10] Rimsky-Korsakov depicted the legendary Russian musician Sadko in an 1867 work in this genre of one-movement compositions that illustrate a story. Richard Strauss' Also Sprach Zarathustra is another of these works.   
  
Answer: symphonic poem or tone poem (prompt on "program music")   
  
[10] The movements of this other Rimsky-Korsakov symphonic poem depict stories from The Arabian Nights and are separated by solo violin intermezzos signifying the title character, the wife of Shahriyar.   
  
Answer: Scheherazade [shah-hare-ah-zahd]   
  
<FA, AUDIO>

4.  **In this poem, Death plays a dice game against Life-in-Death, who sees “four times fifty living men [...] dropped down one by one” although a “thousand slimy things / lived on; and so did I.” The title character of this long poem tells the (\*)** Wedding Guest about shooting an albatross, which leads to there being “water, water, every where, / Nor any drop to drink.” For ten points, name this poem about a sailor written by Samuel Taylor Coleridge.  
  
ANSWER: The Rime of the Ancient Mariner  
  
<LIT, BRIT>

Answer some questions about Nordic influences on English language and literature, for 10 points each.   
  
[10] This Old English epic poem romanticizes the story of the title Geat [“gate”], who aids Hrothgar, the King of the Danes, by defeating Grendel.   
  
Answer: Beowulf   
  
[10] In the Middle Ages, Vikings settled in the “Danelaw” [DAYN-law] in what is now England, and gave the English language the third-person plural pronouns we use today. Name either of those pronouns.   
  
Answer: they or them (accept either or both underlined words)   
  
[10] Snorri Sturluson [“snore”-y STUR-luh-son] wrote the “Prose” work of this name which, with the   
  
“Poetic” one, provides a background to many Norse myths and a description of Old Norse poetic forms.   
  
Answer: Eddas [AY-dah] (accept Eddur; accept Prose Edda or Younger Edda or Snorri’s Edda or Snorra Edda; accept Poetic Edda)   
  
 <LIT, OTHER>

5.  **This civilization’s thinkers developed a belief in material monism, the idea that all objects in the world are made of a single “first element.” One such thinker from this civilization, (\*)** Anaximenes, believed that that element was air; another thinker, Thales, believed it was water. For ten points, name this civilization whose natural philosophers from Miletus inspired its later schools, such as the Lyceum of Aristotle in Athens.  
  
ANSWER: ancient Greece (accept Miletus until it is read, but do not accept other specific Greek city-states)  
  
<RMPSS, PHIL>

One of these instruments made by Stradivarius was owned by Jacqueline du Pre, who disliked it for its unpredictability. For ten points each,  
  
Name this large string instrument. It provides the lowest range in a traditional string quartet and the second-lowest range in many orchestras, behind only the double bass.  
  
ANSWER: violoncello  
  
The Davydov Stradivarius cello once played by Jacqueline du Pre now belongs to this Chinese-American cellist, possibly the most popular classical musician in America.  
  
ANSWER: Yo-Yo Ma  
  
Yo-Yo Ma has used the Davydov to play this Camille Saint-Saens¨ sons] piece for cello and piano, the 13th movement of The Carnival of the Animals.   
  
ANSWER: The Swan (accept Le Cygne)   
  
<FA, AUDIO>

6.  **This man painted The Separation of Light from Darkness and The Last Judgment, in which he appears in the flayed skin of Saint Bartholomew, in a series of frescoes in a Vatican (\*)** chapel. This man’s only signed work is a statue of Mary cradling the body of Jesus, and he sculpted a young man standing contraposto with a slingshot over his shoulder. For ten points, name this Florentine sculptor of Pieta` and a marble David.  
  
ANSWER: Michelangelo di Lodovico Buonarroti Simoni   
  
<FA, VISUAL>

Colonists in New Sweden are believed to have introduced these structures to North America. For ten points each,  
  
Name these somewhat-movable structures, popular in the 18th and 19th century American frontier. Abraham Lincoln’s upbringing in this type of house inspired a popular children’s toy.  
  
ANSWER: log cabin (prompt on cabin; prompt on “Lincoln Logs”)  
  
This U.S. President was called the “log cabin and hard cider candidate” by his Whig supporters. He also used the slogan “Tippecanoe and Tyler too” during his 1840 Presidential campaign, which lasted longer than his actual presidency.  
  
ANSWER: William Henry Harrison  
  
This 20th century politician acknowledged his privileged upbringing in Illinois by noting “I wasn’t born in a log cabin[...]and there’s no use trying to pretend I did.” He lost two Presidential elections to Dwight Eisenhower.  
  
ANSWER: Adlai E. Stevenson II  
  
<HIST, AMER>

7.  **This number is squared in the solution to the Basel problem. One experiment to calculate this number exploits the Buffon's needle problem. Archimedes (\*)** approximated this number, the number of radians in 180 degrees, by bounding it by the perimeters of 96-sided polygons, finding that it is less than 22 over 7. For 10 points, give this ratio of a circle's circumference and diameter, an irrational number approximately equal to 3.14.   
  
Answer: pi   
  
<SCI, OTHER>

If Portugal spends one dollar to produce a unit of cloth while England has to spend $1.50, it still could make financial sense for Portugal to buy English cloth. Answer the following for ten points each.  
  
[10] This economic behavior is the exchange of goods and services between two or more entities - people, countries, etc.  
  
ANSWER: trade (accept elaborations, like free trade, international trade, etc.)  
  
[10] Portugal would want to trade for English cloth if England held the comparative form of this economic concept, as they did in a famous 1817 example. In that example, Portugal was absolutely better than England in production of wine and cloth.  
  
ANSWER: comparative advantage (accept absolute advantage)  
  
[10] This English economist devised that example to show how free trade can benefit countries, even in situations where a country has absolute advantage in all goods, in his Principles of Political Economy and Taxation. He also devised the Iron Law of Wages.  
  
ANSWER: David Ricardo  
  
<RMPSS, SOC SCI>

8.  **This man described a ruler who kept ten thousand white horses, whose milk was fermented to make koumiss. This man also described the efficient empire-wide postal system and the paper currency used by the Yuan dynasty. He was imprisoned by (\*)** Genoa upon returning to his home city, and his stories were collected in the book Il Milione. For ten points, name this Venetian who met Kublai Khan during his travels on the Silk Road to China.   
  
Answer: Marco Polo   
  
<HIST, WORLD>

The “dia” and “para” forms of this behavior induce fields in opposite directions of each other. For ten points each,  
  
[10] Name this property of materials to be attracted or repelled by a certain type of field.  
  
ANSWER: magnetism (accept word forms; accept diamagnetism and/or paramagnetism)  
  
[10] This “permanent” form of magnetism was first observed in iron, inspiring the prefix in its name.  
  
ANSWER: ferromagnetism  
  
[10] Gauss’s Law of Magnetism forbids the existence of these entities, which would be particles with magnetic charge, but no north or south ends.  
  
ANSWER: magnetic monopole  
  
<SCI, PHYS>

9.  **Men who undergo the process of Amrit Sanchar are initiated into this religion and are commanded to wear an iron bracelet and wooden comb. This religion's central text, the Adi Granth, is considered its final (\*)** Guru. Members of this religion, founded by Guru Nanak, practice a form of strict non-violence known as ahimsa [ah-heem-sah] and wear the five K's, including kesh, or uncut hair. For 10 points, name this religion prominent in the Punjab state of India.   
  
Answer: Sikhism   
  
<RMPSS, REL>

Operation Paul Bunyan used helicopters, bombers, and an offshore aircraft carrier to support the removal of a tree from this region near Panmunjom. For 10 points each,   
  
[10] Name this no-man's-land along the 38th parallel. It was created in a July 1953 armistice.   
  
Answer: Demilitarized Zone (or DMZ) (accept, but do not otherwise reveal, any additional information that describes the DMZ as being between North and South Korea)   
  
[10] The DMZ was created at the end of this war. At various points in this war, the capitals of Seoul and Pyongyang were each captured by enemy forces.   
  
Answer: Korean War   
  
[10] This American general led an offensive into North Korea to the Yalu River that triggered Chinese involvement in the war. President Truman removed him from command for insubordination in 1951.   
  
Answer: Douglas MacArthur   
  
<HIST, WORLD>

10.  **For brokering the end of this event, Lester Pearson was awarded the Nobel Peace Prize. Anthony Eden resigned as Prime Minister in the wake of this event, which was opposed by both the US and USSR. This event began with Israeli, French, and British forces invading the (\*)** Sinai Peninsula, and ended with a ceasefire after nine days. For ten points, name this 1956 crisis over control of a man-made waterway connecting the Mediterranean and Red Seas through Egypt.  
  
ANSWER: Suez Crisis (accept any description of a controversy affecting the Suez Canal)  
  
<HIST, WORLD>

These particles come in six flavors, including charm and strange. For ten points each,  
  
Name these subatomic particles with charge values of either positive two-thirds or negative one-third times the charge of an electron.  
  
ANSWER: quarks  
  
Quarks are components of this class of particles, which includes baryons and mesons. A large collider of these particles was built by CERN near Geneva, Switzerland.  
  
ANSWER: hadrons (accept Large Hadron Collider)  
  
Quarks are observed via the study of hadrons, because they have this property and thus are confined to grouping within a hadron. In optics, this concept is additively combined, such that the three primary hues of visible light merge together to create white.  
  
ANSWER: color (accept color charge)   
  
<SCI, PHYS>

11.  **This nation's port cities include Valparaiso and Antofagasta, the latter of which was invaded for its nitrate and copper resources to begin the War of the Pacific. This country is home to Easter Island and the incredibly dry (\*)** Atacama Desert, which lies in a rain shadow west of the Andes Mountains. This country's border with Argentina runs for 3,300 miles, north to south. For 10 points, name this South American country with capital at Santiago.   
  
Answer: Chile   
  
<GEO, GEO>

Answer the following about women in the Old Testament, for 10 points each.   
  
[10] This niece of Mordecai became a Persian queen, and intervened with King Xerxes to save the Jewish people.   
  
Answer: Esther (accept Hadassah)   
  
[10] Deborah was the only woman known to hold this title as the leader of the Tribes of Israel. Other people to hold this position included Gideon.   
  
Answer: Judges of Israel (accept shofet or shoftim; do not accept “King” or similar answers) [10] This Judge harvested honey from the corpse of a lion and defeated many Philistines, but lost his incredible strength when his hair was cut by Delilah.   
  
Answer: Samson   
  
<RMPSS, REL>

12.  **Cyclin-dependent kinase 4 and 6 are needed in this phase to cross the restriction point, where protein p53 may trigger apoptosis. Most mature nerve cells are permanently arrested in this phase, which directly follows cytokinesis. Its (\*)** S subphase is when DNA is replicated, while its G1 and G2 portions are devoted to cell growth. For 10 points, name this “resting phase” of the cell cycle that must be completed before mitosis can begin.   
  
Answer: interphase (accept G1 before “S subphase” is read)   
  
<SCI, BIO>

One re-telling of this novel, The House on Eccles Street, was "written" by the fictional author   
  
Elizabeth Costello. For 10 points each,   
  
[10] Name this James Joyce novel, which follows Leopold Bloom on June 16, 1904, as his life parallels the events of Homer's Odyssey.   
  
Answer: Ulysses   
  
[10] Elizabeth Costello is the title character of a novel by this South African author of Disgrace and Life & Times of Michael K. This man, who lives in Australia, has won two Booker Prizes and the 2003 Nobel in Literature.   
  
Answer: J(ohn) M(axwell) Coetzee   
  
[10] Another retelling of the Odyssey, this time from Penelope's view, was written by Margaret Atwood, an author from this nation. Atwood's novel The Blind Assassin is set in Port Ticonderoga, a fictional city in Ontario.   
  
Answer: Canada   
  
<LIT, OTHER>

13.  **This man described how “some blue-eyed devil [...] had imposed” his ancestors with a slavemaster name in an autobiography co-written by Alex Haley. In March 1964, this man announced his break with Elijah (\*)** Muhammad’s movement, and less than a year later, he was killed by members of that movement. For ten points, name this African-American activist and one-time member of the Nation of Islam who replaced his birth surname, Little, with a single letter.  
  
ANSWER: Malcolm X (accept Malcolm Little before it is read; accept el-Hajj Malik el-Shabazz)  
  
<HIST, AMER>

This event was one of a number of responses to the taxes posed by the Townshend Act, and it was sparked by Sam Adams’ declaration that a meeting at the Old South Meeting House could “do nothing further to save the country.” For ten points each,  
  
Name this December 16, 1773 protest, in which the Sons of Liberty boarded three ships and destroyed chests of imported leaves.  
  
ANSWER: Boston Tea Party (prompt on partial answers)  
  
The colonists weren’t opposed to taxes, period; instead, they protested the unfair conditions of the tax. This popular catchphrase described the colonists’ major grievance with the Townshend Acts; a modified version of it appears on license plates in Washington, D.C.  
  
ANSWER: No taxation without representation (accept Taxation without representation; accept any rephrasing of the general idea, not just these specific words)  
  
The unpopular Tea Act was promoted by this British Prime Minister, who served from 1770 to 1782, including the bulk of the American Revolution.  
  
ANSWER: Frederick North, Lord North  
  
<HIST, AMER>

14.  **A number is algebraic if it is the root of a polynomial with these numbers as coefficients. This subset of the real numbers is densely ordered and countably infinite; that is, there are infinitely many of these numbers between any two of them, and you can list them, unlike a complement set that includes (\*)** pi and the square root of two. For ten points, name this type of number whose decimal expansion either terminates or repeats and which can be written as a fraction.  
  
ANSWER: rational numbers  
  
<SCI, OTHER>

These particles were first theorized by Murray Gell-Mann. For 10 points each,   
  
[10] Name these elementary particles that come in six flavors - up, down, charm, strange, top, and bottom.   
  
Answer: quarks   
  
[10] This particle, discovered by James Chadwick in 1932, contains one up quark and two down quarks; thus, it has 0 charge. Some of them can be found along with protons in the nucleus.   
  
Answer: neutrons   
  
[10] This class of particles contain a quark-antiquark pair. An example of one is J/psi [jay-sigh], which contains one charm quark and one charm antiquark.   
  
Answer: mesons   
  
<SCI, PHYS>

15.  **Hydrogenating an unsaturated fat reduces these structures. These structures cannot twist, due to p-orbital overlap above and below the inter-nuclear axis. This structure exists in sp2 [”s p 2”] hybridized molecules as, for example, between (\*)** carbon atoms connected by one pi bond and one sigma bond. Dienes have a pair of these structures, which alternate in benzene. For ten points, name this type of second-order bond that covalently shares four electrons.  
  
ANSWER: double bonds  
  
   
  
The protagonist of this work attacks Phil Connor, his wife Ona’s boss, after Ona reveals that he demanded sexual favors for hiring her. At the end of this novel, a child is locked in a factory and eaten by rats. The Lithuanian immigrant

In June 1976, thousands of high school students in Soweto, a township outside this city, protested the use of  
  
Afrikaans as the official teaching language, and over 100 protesters were killed by police. For ten points each,  
  
Name this city, the largest in its country. Soweto was officially incorporated into this city in 2002.  
  
ANSWER: Johannesburg  
  
Johannesburg is the largest city in this African country, where Afrikaans was supported by the controlling government as part of an official state policy of racial segregation called Apartheid.  
  
ANSWER: South Africa  
  
This late President of South Africa and Nobel Peace Prize winner lived in Soweto until his 1962 arrest and transfer to Robben Island; he briefly returned to Soweto after his 1990 release from prison.  
  
ANSWER: Nelson Mandela   
  
<HIST, WORLD>

16.  **A barber pole sits in front of a row of businesses in this man’s Early Sunday Morning. A small red teapot is on the table between two women at a restaurant in his Chop Suey. This artist of (\*)** Automat painted an ad for five-cent Phillies cigars in another of his works. In that painting, two men and a woman are being served inside a well-lit, doorless diner. For 10 points, name this American painter of Nighthawks.   
  
Answer: Edward Hopper   
  
<FA, VISUAL>

Answer the following about works of literature that have sparked debates about their authorship, for ten points each.  
  
“Anti-Stratfordians” believe that this man did not write the many plays attributed to him, though most experts believe that he is in fact the author of such plays as King Lear, Othello, and A Midsummer Night’s Dream.  
  
ANSWER: William Shakespeare  
  
Pierre Louys wrote two essays asserting that Molìere’s plays were actually written by Pierre Corneille an author in this European language.  
  
ANSWER: French language (accept la langue francais)  
  
Harper Lee was the best friend and research assistant of this man, leading to rumors that he may have written her novel To Kill a Mockingbird and that she in turn may have contributed to this man’s novels, such as In Cold Blood and Breakfast at Tiffany’s.  
  
ANSWER: Truman Capote (accept Truman Streckfus Persons)   
  
<LIT, OTHER>

17.  **These values exist at a function’s critical points when the function is concave down. The graph of y equals x squared has no global one of these places, but y equals negative x squared has one at the (\*)** origin. A function has one of these points where its derivative changes from positive to negative; that is, it stops increasing and begins decreasing. For ten points, name these points, the highest point a graph reaches, contrasted with a function’s minimum.  
  
ANSWER: maximum (accept supremum)  
  
<SCI, OTHER>

The diverting of water from the Amu Darya and Syr Darya for irrigation caused this large body of water to start shrinking rapidly in the 1960s. For 10 points each,   
  
[10] Name this body of water, once one of the largest lakes in the world, found between Kazakhstan and Uzbekistan.   
  
Answer: Aral Sea   
  
[10] The Karakum Canal diverted the Amu Darya to irrigate this crop; as a result, Uzbekistan is the world’s sixth largest producer of this textile, which is also prominently grown in Egypt.   
  
Answer: cotton   
  
[10] Uzbekistan is east of, but does not have a shore on, this largest lake in the world, which was once fed by the Amu Darya.   
  
Answer: Caspian Sea   
  
<GEO, GEO>

18.  **The title character brews the “balm of Fierabra´s” to cure his and his companion’s wounds, but they just get sick. After battling the Knight of the White Moon, the title character is forced to cease all acts of chivalry for a year. This work’s title character and squire, (\*)** Sancho Panza, journey to save the “princess” Dulcinea on his elderly steed, Rocinante. For ten points, name this novel about a windmill-dueling, delusional “knight,” written by Miguel de Cervantes.  
  
ANSWER: The Ingenious Gentleman Don Quijote of La Mancha (accept El ingenioso hidalgo don Quijote de La Mancha)  
  
<LIT, EURO>

A charged particle in one of these entities will undergo uniform circular motion. For 10 points each,   
  
[10] Name these fields that arise from moving charges. They are described by the Biot-Savart [bee-OH sah-VAR] law and measured in Teslas, unlike their electric counterparts.   
  
Answer: magnetic fields   
  
[10] This rule determines the direction of the force on a particle given the magnetic field and velocity. A similarly named rule gives the direction of the magnetic field around a current-carrying wire.   
  
Answer: right-hand rule   
  
[10] This law, one of Maxwell’s equations, relates the line integral of the magnetic field to enclosed current. It can be used to write magnetic field as a function of current for solenoids.   
  
Answer: Ampere’s law   
  
<SCI, PHYS>

19.  **This location contains the Fields of Asphodel, and one of this land’s judges, Rhadamanthus, ruled the region of Elysium in this land. Tantalus was unable to reach food or water in this location, which contains a descent into (\*)** Tartarus. Eating part of a pomegranate forces Persephone to stay in this location for part of every year. For ten points, name this Greek underworld ruled by a namesake death god.  
  
ANSWER: Hades (accept Greek underworld until it is read; prompt on “underworld” alone)  
  
<RMPSS, MYTH>

This expansive novel includes a nineteen-chapter analysis of the Battle of Waterloo. For ten points each,  
  
[10] Name this long French novel in which Inspector Javert pursues the convict Jean Valjean, who saves Fantine’s daughter, Cosette, from the cruel Thenardier family.  
  
ANSWER: Les Miserables (accept The Miserables or The Miserable Ones)  
  
[10] Les Miserables is a novel by this author of Toilers of the Sea and The Hunchback of Notre Dame.  
  
ANSWER: Victor Marie Hugo  
  
[10] In Les Miserables, Cosette falls in love with this revolutionary and member of the Friends of the ABC. During the June Rebellion, Jean Valjean saves this man, who rejects Eponine and marries Cosette.  
  
ANSWER: Marius Pontmercy (prompt on “Pontmercy”)  
  
<LIT, EURO>

20.  **An essay by Thomas De Quincey discusses “the Knocking at the Gate” in this play, arguing that hearing Lennox and a nobleman from Fife entering Inverness Castle ends a stupor caused by a murder. This play’s title murderer becomes the (\*)** Thane of Glamis and Cawdor, in accordance with a prophecy given by three witches to him and Banquo, and takes the throne after killing King Duncan. For ten points, name this “Scottish play” by William Shakespeare.  
  
ANSWER: The Tragedy of Macbeth  
  
<LIT, BRIT>

This class of organic compounds is defined by having a hydroxyl group, or an oxygen bonded to a hydrogen. For ten points each,  
  
Name this class of compounds that includes C2H5OH, known as ethanol. ANSWER: alcohols  
  
Methanol, or wood alcohol, has a molecular form with this many carbon atoms. Similarly, methane is an alkane consisting of this many carbon atoms.  
  
ANSWER: one  
  
Don’t drink wood alcohol. The body metabolizes it into methanal [meth-an-al], better known as an embalming agent by this name. This carcinogenic compound will then metabolize into formic acid, which will make you blind.  
  
ANSWER: formaldehyde (accept formalin)  
  
<SCI, CHEM>