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## **Breaking News Headline**

**Seattle Daily Times**

**February 23<sup>rd</sup>, 2010**

Mr. John Wait of Seattle, WA, was on his way home from work as a corporate attorney at Boggs, Plubark, and Epstein Law Firm on a cold and rainy Thursday afternoon at 5:26pm. He had just finished negotiating an important case involving the overseas Mayweather Co., Inc, LLPC. He had won the case and several millions of dollars were trading hands due primarily to his savvy negotiation skills and impeccable understanding of international shipping law.

Suddenly Mr. Wait's car swerved abruptly off the road, plunged down an embankment, and crashed front-first in between two huge boulders. Onlookers in two separate cars immediately pulled over and rushed to the edge of the precipice. Scrambling down, one of the onlookers found Mr. Wait covered in blood and unresponsive. The onlooker, Mr. Benjamin March, after bending over the body crumbled inside the car for about a minute yelled back up to the gathering crowd; "he has no pulse and is dead!

Mr. Wait had a wife and three children and his estate was worth an estimated 23.2 million dollars, following his latest court victory.

Detectives with the Seattle Police Department reported that Mr. Wait's neighbors, John and Maggie Purell, stated that they had seen Mr. Wait's wife Kathleen arguing with him on the lawn of their Seattle home that morning after a party the night before in celebration of Mr. Wait's courtroom victory.

## **Breaking News Headline**

**Seattle Daily Times**

**February 25<sup>th</sup>, 2010**

At 11:23pm yesterday evening a Mr. Benjamin March, the first responder to the John Wait accident on State Hyw 90 in Seattle, was found dead in an undisclosed downtown Seattle hotel room. The cause of death is as yet not known but the hotel room experienced a fire after which the badly burned body was found. Mr. March was found upon autopsy to have small amounts of elemental potassium, zinc, and human skin tissue under his fingernails and two separate types of burns on his body; electrical and fire. \$250,000.00 was found still secured in a large metal suitcase in the motel room closet.

Preliminary DNA analysis revealed that the tissue under his nails came from a wanted felon, Mr. Mark Hollingsworth. Mr. Hollingsworth is wanted on 2 counts of armed robbery and one count of manslaughter. Mysteriously, Mr. Hollingsworth was married briefly to Carla Purell, daughter of Maggie and John Purell, neighbors of the Wait family reported on earlier this week by the Seattle Daily Times.

Mr. Hollingsworth was known to have worked for Bright Tree Electrical Co. and to have had some basic knowledge of chemistry (not nearly as much as you, however, since he's a bad guy). It is believed that forensic investigation of the cause of the fire will lead police to the whereabouts of Mr. Hollingsworth.

## **Breaking News Headline**

**Seattle Daily Times**

**March 5<sup>th</sup>, 2010**

Detectives with the Seattle police department reported today that a bottle of water recovered from the car of Mr. Wait had DNA evidence from a fingerprint stain that showed a rare gene for curly eyelashes that was also found in DNA evidence from under the hood of Mr. Wait's car. This same DNA evidence was also found in the apartment of Mr. March. Detectives also found traces of elemental Iodine on the bottle in Mr. Wait's car.

## **Breaking News Headline**

**Seattle Daily Times**

**March 16<sup>th</sup>, 2010**

The coroner with the Seattle police department announced today the preliminary autopsy results performed on both Mr. John Wait and Mr. Benjamin March. The coroner's preliminary report states that both men had trace amounts of something not normally found in the human body, Sodium hydroxide (NaOH), in their systems; specifically concentrated in the tissue around their hands and lower arms.

The coroner's report also stated that Mr. Wait and Mr. March shared a gene that has not been present in human evolution for 1.25 million years. The gene, SQR43-p, is responsible for synthesizing a hair-follicle-stimulating protein in humans making the people who possess this gene much hairier than a normal person with long thick hair covering greater than 80% of their bodies. The final coroner's report is forthcoming.

## **For all Students: Facts & Questions**

7<sup>th</sup> and 8<sup>th</sup> grade students... read all the facts of the other grade but only answer your own grade's question...

### **For Physical Science students:**

Fact 7: The pathologist wants to confirm or deny that her litmus paper test was correct and get an actual pH number for the skin tissue pH of the two men.

Question 7: What type of paper should the pathologist use to perform this test? If the NaOH used was a strong base what pH number would you expect the pathologist to find? What are three physical characteristics that the skin tissue would have if they were saturated with this strong base?

Fact 6: The forensic pathologist has just completed another test on the two deceased men. This time she did a litmus paper test on their skin tissues.

Question 6: Predict what color a red and a blue pH paper indicator test would show if performed on Mr. Wait's and Mr. March's hand and arm tissue. Note; there are two answers to this question; think of our pH lab in class? Do not make any assumptions or predictions at this point.

Fact 5: A new process in the solar energy industry uses large quantities of NaOH in the production of an advanced solar collecting panel, which are commonly produced at both the green firms Mayweather Co and Bright Tree Electrical.

Question 5: What is NaOH? What is it commonly used for? Is it dangerous? What would neutralize it? Can it be strong? How strong? Can it be weak? How weak? What is used to measure strength and weakness of acids and bases? What is the solute in making NaOH? What is the solvent? What are precautionary measures in working with it? Is sodium hydroxide a producer of OH<sup>-</sup> or H<sup>+</sup>? How do you know? Could NaOH be involved in either man's demise? Now, you all have been doing a lot of inferring. Limit yourself only to statements of fact and do not enter the realm of conjecture. You must defend your answer with background chemistry knowledge and scientific method/critical thinking analysis.

Fact 4: Detectives found evidence of Potassium under the finger nails of Mr. Hollingsworth, who was found earlier today at his home in Seattle. He had just returned from a trip to Chile and had caliche mud embedded in the soles of his shoes. The nation of Chile also today announced the incorporation of LightAll Solar Company, the worlds second largest solar energy supply company, second only to Mayweather Co., Inc, LLPC the world's largest producer of solar energy, the primary shareholder of whom happens to be Kathleen Wait, wife of the late Mr. Wait.

Question 4: Chief inspector Thompson is eager to compile the evidence against one suspect in the death of Mr. Wait and

Mr. March. Give your recommendation to the Chief Inspector for the deaths of both these men.

Fact 3: Crime scene investigation of the motel room revealed trace amounts of solid granular zinc chloride, an ionic compound, and an exposed electrical outlet.

Question 3: Knowing the properties of ionic compounds (see pg 188 and 195) do you think the zinc chloride found on the scene could have somehow to be involved with Mr. March's death (hint; think of our "Shining Light on Ions" lab)? You must defend your answer with background chemistry knowledge and scientific method/critical thinking analysis.

Fact 2: A complete forensic investigation of the Wait home revealed two party balloons filled with chlorine gas instead of helium. In an interview with Mr. Wait's supposed son Ben (see "Life Science" below) it was revealed that he is an environmental chemist with the Oregon-based CleanAirNow research firm who worked on Ozone Layer depletion by industrial refrigerants and consumer spray can additives such as chlorofluorocarbons.

Question 2: What are the properties of halogen group elements in general and chlorofluorocarbons specifically and how might this relate to Mr. Wait's death? You must defend your answer with background chemistry knowledge and scientific method/critical thinking analysis.

Fact 1: small amounts of elemental potassium, not found purely in nature are found by detectives just under the wiper blade water reservoir and on the ground under the engine.

Question 1: What are the properties of the Alkali metals in general and potassium in particular and might this element be related to Mr. Wait's death? You must defend your answer with background chemistry knowledge and scientific method/critical thinking analysis.

### For Life Science students:

Fact 4: Upon investigation of the homes of both Mr. Wait and Mr. March, investigators with the Seattle police department discover large quantities of used cans of shaving cream, disposable razors, and Nair.

Question 4: Would a person covered in a thick coat of hair be at an advantage or disadvantage in today's climate? Why/why not? Give your ideas, based on this new evidence as to what happened to Mr. March & Mr. Wait and the relationship that both men may have shared.

Now, you all have been doing a lot of inferring. Limit yourself only to statements of fact and do not enter the realm of conjecture. If you do make a guess, state that you are inferring. You must defend your answer with background evolution knowledge and scientific method/critical thinking analysis.

Fact 3; Both parents of Mr. Hollingsworth do not have the gene for curly eyelashes, however one of each of their two grandfathers has curly eyelashes, because detectives noticed photos of the grandfathers in the home of Mr. Hollingsworth. Unfortunately, Mr. Hollingsworth does not have curly eyelashes. The forensic geneticist, however, insists on an expensive genetic test of Mr. Hollingsworth's DNA to the objection of the rest of the investigation team. Neither Mrs. Wait, nor her grandparents have curly eyelashes.

Question 3; Chief inspector Thompson is eager to compile the evidence against one suspect in the death of Mr. Wait and Mr. March. Give your recommendation to the Chief Inspector for the deaths of both these men. Is there a possibility that Mr. Hollingsworth, Mrs. Wait, or someone else could be the murderer even though they do not have curly eyelashes? Support your case using two or more Punnett squares that prove your point.

Fact 2; Detectives suspect a connection between Benjamin March and Ben Wait, son of accident scene John Wait. They have an old tissue sample from the hospital Ben Wait was born in and they have Mr. March's badly burned body. But the forensic genetics department of the Seattle police department just had a budget cut from the Governor of Washington and can only do one of the genetics tests below to see if these two men are related or not.

Question 2; What genetics test from the three described below would you do and why? You must defend your answer with background genetics knowledge and scientific method/critical thinking analysis.

Test 1; Compare the amino acid sequence of three proteins isolated from skin samples of both men.

Test 2; Compare the nitrogen base sequence from chromosome number 13 of both men.

Test 3; Compare the mid-digit hair and tongue rolling ability of the two men.

Fact 1; Mr. Wait was known to have a possible son, Ben, who lived in another family from an early age and who had publicly stated that he critically disagreed with Mr. Wait's courtroom tactics. Two weeks ago Ben had mysteriously been seen in Seattle, where he hadn't lived before. Ben has attached earlobes. Both Mr. Wait and his wife are heterozygous for Free earlobes.

Question 1; Could Ben possibly be the prodigal son of Mr. Wait? You must defend your answer with background genetics knowledge and scientific method/critical thinking analysis.