Air and Space this Week

Item of the Week

The Thrill of Discovery, and the Agony of Defeat

With a tip of the A+StW hat to ABC, The Wide World of Sports, and Vinko Bogataj!

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THE THRILL OF DISCOVERY

Discovery of new things gives us all a thrill, whether it is finding out what is over the next hill or having a new planet "swim into one's ken." I've tried to convey this in a number of topics a number of times in writing A+StW. Examples include the discovery of Uranus, Neptune, and Pluto. But in those cases, there was a time lag between observation and realization of the importance of the discoveries. This week we have two examples where the person(s) making the discovery knew (almost) right away just what they had discovered and how important it was.

The "Called Shot" at Io

Babe Ruth has a number of claims to fame, but one of the best is the "Called Shot" in the third game of the 1932 World Series. Ruth was being heckled by the Cubs bench (he had already hit a three-run homer earlier in the game). Legend has it that Ruth stepped out of the batter's box, pointed to the centerfield fence, and hit the very next pitch far over the spot he pointed to, thereby "calling his shot."

A similar "called shot" happened in the exploration of the Solar System, when *Voyager 1* was approaching Jupiter. We had seen the Jupiter system "up close" twice before, with the fly-bys of *Pioneers 10* and *11*, but *Voyager 1* had better cameras, and scientists were looking forward to seeing Jupiter and its moons in more detail.

A few days prior to the upcoming fly-by, a paper appeared in the **March 2**, 1979 issue of the prestigious journal, *Science*. It was authored by Stanton Peale, Pat Cassen, and Ray Reynolds, who had done calculations on the tidal forces affecting Jupiter's innermost large moon, Io. They showed that the internal heating generated by those forces would be high enough to melt Io's interior, and would likely cause active volcanism. They predicted ("called their shot") that *Voyager 1* images would show fresh volcanic features, and perhaps volcanoes in the process of eruption.

Images acquired during the fly-by on **March 8** showed ample evidence of recent volcanism, and actually showed a volcano in action, just as predicted a mere six days before. SCP had "hit one far over the fence!" [It would be fair to say that other planetary scientists were extremely impressed by the audacity of their prediction and its immediate and obvious confirmation!]

The new version of the National Air and Space Museum's Exploring the Planets gallery, presently under construction, will include stories about important events in Solar System exploration. I was proud to be included in the story process, and one of my contributions was the story of the Called Shot at Io. I've placed an edited version of my contribution in the Archive: Other Stuff section of the Air and Space this Week website that goes into the story in much more detail. If you are interested in this aspect of how Science Marches On, check it out!

The Discovery of Uranus' Rings

I like this story because it is one of the rare cases where an observation was a discovery whose import was immediately recognized.

I took a riff off of the Monty Python sketch about the Royal Society for the Putting of Things on Top of Other Things when I added "The World Society for the Understanding of Things that Can Be Understood from the Study of Things in Front of Other Things" section to the News: Astronomy part of A+StW, because there are a LOT of astronomical advancements that come from things passing in front of other things (*e.g.* eclipses, planetary transits, discoveries of exoplanets, gravitational lensing, etc.). The discovery of the Uranian ring system is another example.

Uranus was going to pass in front of a faint star, SAO 158687, on the night of **March 10**, 1977. Astronomer James Elliot was aboard the Kuiper Airborne Observatory, high over the Indian Ocean. His equipment was primitive by today's standards; the signal from KAO's infra-red telescope was being displayed on an analog strip recorder. He was looking for changes in the star's brightness as Uranus passed in front of it, hoping to see a dimming caused by Uranus' atmosphere [akin to the observations made as *Mariner 4* passed behind Mars]. Elliot and his assistants Jessica Mink and Ted Dunham watched the strip recorder with bated breath as Uranus approached the star. Just before Uranus passed in front of the star, there were five small drops in brightness. After the star reappeared from behind Uranus, there were another five small drops in brightness. Elliot et al. knew immediately what had caused the five dips; Uranus had to have a faint ring system! Forget the Uranian atmosphere, this was a big deal!

During the rest of the KAO flight, Elliot, Mink, and Dunham drafted the text of the discovery telegram they would send to Brian Marsden of the Harvard/Smithsonian Center for Astrophysics, the clearinghouse for such discoveries [the draft letter is now in the collection of the Smithsonian National Air and Space Museum]. You can tell from Elliot's writing that he was quivering with excitement, and if you are like me, we can feel the thrill of discovery vicariously!

Jim Elliot died on March 3, 1977. He was well-respected by his colleagues and students alike. The KAO was retired and replaced by the SOFIA airborne observatory, but not after Elliot, Dunham, and other astronomers used it to conclusively prove in 1988 that Pluto has an

atmosphere, *a la Mariner 4* at Mars. I couldn't find out more information about Ted Dunham, but Jessica Mink went on to contribute to the discovery of Neptune's rings, and created a number of software packages for astrophysics use.

THE AGONY OF DEFEAT

Aerial combat is extremely dangerous, and many pilots and aircrew have lost their lives in combat since WW1, either to enemy fire or operational accidents. This story is about Phelps Collins, the first pilot of the U.S. Air Service to die in action, on ***March 12****, 1918.*

When WWI broke out, a number of Americans volunteered to fight, even though the U.S. was not then at war. Their unit was originally called the Escadrille Americaine, but the German government complained that the U.S. was supposed to be neutral in the conflict, so the unit was renamed the Lafayette Escadrille, in honor of the Marquis de Lafayette and his contributions to the U.S. Revolutionary War [how many towns in the U.S. are named for him? A: a LOT!]. Initially, there were only seven American pilots flying for France, but the number grew to a total of 38 over time. There were also five French nationals on the roster. The unit first saw action at the Battle of Verdun. Kiffen Rockwell scored the unit's first victory on May 18, 1916. Victor Chapman was the first Escadrille pilot KIA, on June 23. French-born U.S. citizen Raoul Lufbery was the unit's first ace and ultimate high scorer, with 16 confirmed victories.

The Lafayette Escadrille was disbanded on February 8, 1918, after the U.S. had declared war. The American fight in the air was now under that auspices of the U.S. Air Service, part of the U.S. Army's American Expeditionary Force at the time.

Captain Phelps Collins had enlisted in the French Aviation Service in May, 1917, and transferred to the U.S. Air Service when America entered the War. He was assigned to the 103rd Aero Squadron, the successor to the Lafayette Escadrille, based at La Noblette. He was part of a five-plane force sent out to intercept German aircraft in the vicinity of Paris on **March 12**, 1918. His unit was flying SPAD VII fighter planes, flying at 15,000 feet. Ground-based observers saw his airplane leave the formation, circle for thirty minutes, then fall into a spin and dive into the ground. He likely passed out from hypoxia (today pilots flying above 12,000 feet have to be in a pressurized cockpit or have an oxygen system in use), however, the cause of his crash was never officially determined; it could have been some unseen enemy action.

In any case, Collins was dead, the first KIA in the history of the U.S. Air Service. His loss, and the loss of American pilots before and since, was sorely felt.

Phelps Collins was born in Alpena, Michigan. His father was the president of the Alpena Manufacturing Company, which produced (among other things) the Alpena Flyer automobile. Phelps opened a construction supply company shortly before the War broke out in Europe. He joined many other adventure-seekers in volunteering to fight before the U.S. was involved in the War.

Phelps was a natural pilot, well respected by his pilot colleagues for his flying skill. He scored two confirmed victories, and had three "probables" during his career.

A new public airport opened in Alpena County in 1931, built by crews under the WPA. It was named Phelps Collins Field in honor of the hometown hero. The field was used for military training as well as civilian flying, during the 1930s, and became an important training facility during WWII. After WWII, the field was used by civilians, but soon the Air National Guard began using it for training, and it became known as Phelps Collins Air National Guard Base. It is still in use by the ANG, and is now known as the Alpena Combat Readiness Training Center.

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The Discovery of Uranus' Rings

The discovery of Uranus' rings is covered in the previous Item of the Week about the discovery of Uranus; see: http://www.airandspacethisweek.com/assets/pdfs/20210308%20Uranus.pdf

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Phelps Collins

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