

## CASE REPORT

### GENERAL

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# Watch for Those Fragments of Evidence: The Use of an Automatic Timepiece to Help Correlate a Helicopter Crash Site from the Vietnam War\*,†

**ABSTRACT:** This case study illustrates the use of the date function on an automatic wristwatch to help identify a Vietnam War helicopter crash site. The location of a crash incident can sometimes be uncertain because of inadequate or inaccurate wartime records and the passage of time. Artifacts recovered from a prospective crash scene are regularly used to correlate the loss incident. In this case study, a recovered automatic watch displayed a date 2 days later than the reported loss incident. Although the date conflicts with the aircraft crash incident report, it is observed that a fully wound automatic watch continues to work for *c.* 2 days after movement of the watch ceases. Thus, the watch's date in fact correlates with the aircraft crash incident report. It is noted that automatic watches may also be used to date scenes of crime.

**KEYWORDS:** forensic science, forensic archaeology, time since death, circumstantial evidence, automatic wristwatch, Vietnam War

The objective of the Joint POW/MIA Accounting Command/Central Identification Laboratory (JPAC-CIL) is the identification of U.S. military personnel, certain American civilian personnel, and certain allied personnel unaccounted for from World War II, the Korean War, the Vietnam War, and other conflicts and contingencies. The positive identification of a missing person is reached through the convergence of multiple lines of evidence, with each line producing its own separate analysis and report. These lines of evidence include:

- Background research that correlates the loss incident to a specific location (Historical Report)
- An archeologically sound recovery of the purported loss location (Search and Recovery Report)
- Forensic anthropological assessment of skeletal remains (Forensic Anthropology Report)
- Forensic odontology assessment of dental remains (Forensic Odontology Report)
- Analysis of artifacts recovered in association with the remains (Material Evidence Report)

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- A DNA analysis of the skeletal material (Armed Forces DNA Identification Laboratory report)

Thus, a single case could potentially have six separate analytical reports associated with it. All available reports are reviewed together to evaluate the strength of the combined evidence. The more these separate reports agree, the stronger the case for positive identification of recovered remains. When agreement is consistent, the weight of the identification is supported across the multiple lines of evidence. Unfortunately, there are a variety of factors that impede recovery and identification efforts, including inadequate loss location information, the great time span between the loss and investigation/recovery of a site, taphonomic conditions that led to deterioration or destruction of skeletal material and DNA potential, and other conditions beyond the JPAC-CIL control. As such, cases commonly lack one or more of these lines of evidence, and the weight of the case is then concentrated on those areas that can be assessed. This is true not only when certain types of research/analyses are unavailable (e.g., if no teeth were recovered, no dental assessment can be made), but also when the elements to be assessed are scarce. For example, an odontologist comparing a full set of teeth to antemortem dental charts and radiographs will feel more comfortable with their assessment than an analysis where only three of 32 teeth are present. However, if the evidence upon which the weight is placed is solid, then the identification will stand. For instance, mtDNA evidence is usually considered very strong, and in some cases, it may be the only line of evidence worthwhile. While these lines of evidence are familiar, it is sometimes the least apparent pieces that end up making a significant contribution to the case. This article presents a case where the calendar setting on an automatic wristwatch helped to correlate a loss incident, and thus provided a strong line of evidence linking the loss incident with the recovered remains and associated artifacts.

## Case Background

This case involves the May 23, 1969 loss of a UH-1H (Huey) helicopter during the Vietnam War. According to military records, at c. 2:00 PM, the helicopter was in the process of extracting a joint team of American soldiers and Montagnard allies from a location in Cambodia when it began to take heavy ground fire. The aircraft subsequently struck the top of a tree line and crashed c. 50 m away from the extraction point. Eight Americans, three Montagnards, and two North Vietnamese prisoners were onboard when the aircraft crashed. A short while after the incident, a rescue effort was launched. All of the Americans were either rescued or their bodies recovered, with one exception: the last American was pinned underneath the helicopter, and recovery of his remains proved to be impossible without heavy lifting equipment. With darkness approaching and enemy activity in the area, the rescue team was forced to leave without his body. The fate of the five non-American passengers was not documented in the case records. Two days after the rescue effort, an observation flight over the crash site revealed that an improvised road had been cut through the jungle, and the helicopter had been removed (possibly to salvage the equipment or to place the wreckage on display). From the scattered debris, it was evident that the wreckage had been loaded onto some type of large vehicle and transported away down the newly cut road. The aerial search of the crash site revealed no sign of a body, and no follow-up ground search was ordered. No further action regarding this loss was conducted during the remainder of the Vietnam War.

Between February 1993 and March 2002, Joint U.S./Kingdom of Cambodia teams conducted three investigations into the loss of this aircraft. The combined investigations located a number of primary and secondary witnesses of the crash. These witnesses were consistent in placing the event at a certain location within 1 km of the recorded loss location. In addition, this is the only documented helicopter crash site involving unaccounted-for Americans within a 15 km radius of the recorded loss incident. The investigation teams surveyed the location identified by the witnesses and recovered a number of aircraft parts consistent with a Huey helicopter. While this was significant information, it was still not strong enough evidence to correlate the site positively with the reported crash incident.

Although there was some contradictory witness information, the investigation teams were still able to reconstruct the general course of events following the crash. According to witnesses, the night after the helicopter crash and the rescue operations, a group of Khmer Rouge soldiers, guided by local militia, cut a road to the crash site. The helicopter was loaded on a truck and transported to the provincial capital of Mondolkiri. Three bodies were seen at the crash scene during this operation. Some of the witnesses claimed that the bodies were left on the surface of the ground, while others claimed that they were buried several days later. It is unclear as to why the U.S. observation flight over the site 2 days after the crash failed to see these three bodies. Official Cambodian records of the loss incident are nonexistent, as all records within the province prior to 1979 were destroyed by the Khmer Rouge. In addition, the Khmer Rouge, during their many political purges, had executed all former provincial officials including any that may have had knowledge of this event.

Based on the witness testimonies, the presence of Huey helicopter wreckage at the site, and U.S. records of the loss incident, the site was recommended for excavation. From January 17, 2004 through February 11, 2004, a JPAC team excavated 480 square meters of the purported helicopter crash area (Fig. 1). The team



FIG. 1—Aerial photograph of the completed excavation of the helicopter crash site.

recovered fragmentary human remains, personal effects, U.S. military-related equipment, and aircraft wreckage. All of the remains and artifacts were transported to the JPAC-CIL for analysis. Included in the recovered personal effects was an automatic self-winding watch with a calendar function.

As mentioned previously, each class of evidence undergoes separate analysis. The significance of the proximity of the calendar date on the automatic watch in relation to the recorded aircraft crash incident date was noted during the analysis and review of the personal effects for the Material Evidence Report.

## Caravelle Automatic Wristwatch

Of the five personal effects recovered during the excavation of the crash scene, one item, a Caravelle brand automatic wristwatch, is significant, as it helped to correlate the site positively to the loss incident. The Caravelle line of watches was introduced in 1962 by the Bulova Watch Company, Inc. and continues to be a popular brand (<http://www.bulova.com/brands/caravelle/caravelle.aspx?brand=caravelle>).

The recovered watch is in surprisingly good condition considering that it had been buried in an acidic jungle soil for c. 35 years. The silver-colored watch has a bracelet watchband that has been separated into five refitting pieces consisting of a watch body, two watchband portions, and two covers for missing connecting pins that would attach the bracelet portions to the lugs of the watch body (Fig. 2).

The watch body case and the crystal are intact. The watch dial is black with silver-colored hands and hourly markers. The hands are oriented at the approximate time of 2:50 (Fig. 3). Instead of a number at the 3 h position, there is a date aperture that reads “SUN” (representing the day of the week) in black letters over a white background and “25” (representing the date) in white letters



FIG. 2—The recovered Caravelle automatic wristwatch.



FIG. 3—Recovered Caravelle watch face and back.

with a black background. White text on the watch face reads: “CARVELLE AUTOMATIC; SUPER WATERPROOF; T SWISS T.” The right side of the watch body has a crown with a “C” embossed on it representing the manufacturer.

A 24-h World Time Zone bezel is present around the outside of the crystal. The bezel displays names of major world cities or areas for each increment listed on two alternating lines around the perimeter. Portions of place names are missing because of corrosion. There is a black and white 24-h chapter ring around the perimeter underlying the crystal that counts from “0” to “23” starting at the 6 h position and increasing in a clockwise direction. The outside bezel is oriented with the label “GREENWICH TIME,” and the pointer symbol “▼” located at 23.5 on the chapter ring.

The back of the watch case has an imprinted text which reads “SHOCK; RESISTANT – CARAVELLE – STAINLESS; STEEL” arching around one half and “– WATERPROOF – ANTI-MAGNETIC – AUTOMATIC –” on the opposing half. The center of the back is flat with a small “8” imprinted near the bottom. This number likely refers to the year of manufacture, that is 1968.

## Discussion

Functional automatic watches have been around since early 1930s. Also known as self-winding or perpetual watches, these time-pieces are powered by the motion of the wearer’s arm movement rather than a manual winding stem or battery. In most cases, the movement of the wrist causes the rotor, a small weight within the watch case, to rotate back and forth and wind the watch’s mainspring (1,2). Many automatic watches include a calendar aperture where a numerical date is displayed along with either the month or the day.

In regards to the recovered Caravelle wristwatch, the authors contacted the Bulova Corporation to inquire about its wind-down time. A company technical representative indicated that the longer the watch is worn, the longer it will run. That is, if the watch is only worn for a couple of hours, the automatic winding mechanism will power the watch for a shorter period of time than that of a fully wound watch. Furthermore, a fully wound Caravelle automatic wristwatch will continue to run for *c.* 30–48 h after movement ceases.

The helicopter crash occurred at *c.* 2:00 PM on May 23, 1969. The recovered Caravelle wristwatch has a time of 2:50 (AM/PM unknown) and a calendar date of Sunday the 25th. While the loss incident report provides the approximate time and date of the crash, it does not record which day (i.e., Monday, Tuesday, etc.) it occurred. In contrast, the watch’s calendar aperture displays the day

(Sunday), but not the month. However, a review of the 1969 calendar indicates that 23 May was on Friday and the 25th fell on a Sunday. If the Caravelle watch was fully wound at the time of the crash, it should have stopped sometime about 30–48 h later. Thirty to 48 h after 2:00 PM on Friday May 23, 1969 falls between 8:00 PM Saturday evening May 24th and 2:00 PM Sunday afternoon May 25, 1969. As the watch’s time and date indicate that it stopped ticking either at 2:50 AM or 2:50 PM on Sunday, it thus correlates the excavated site to the reported crash incident and establishes a strong line of evidence between the incident and the recovered artifacts and remains.

To be clear, it is the date (Sunday the 25th) on the watch, not the time that is the significant finding. The reported time of the crash incident and the run-down time of the watch are approximate. Because of this, the accuracy of any time estimation could be off by a few hours on either end of the 30–48 time frame. However, even with approximation, this time frame provides enough information to correlate the incident using the date.

An additional, although less significant finding in light of the date correlation, is that the year of the watch’s manufacture provides a *terminus post quem* of 1968 for the crash site. As stated, the watch, excavated within the context of the crash site, had the number “8” stamped in the back of its case indicating that it was likely made in 1968. The date of the crash could not have occurred before the watch was made. The reported crash year was 1969, so there is no conflict with the date of manufacture. Indeed, the manufacture date supports the findings that correlate the excavated site to the crash incident.

When possible, JPAC endeavors to return recovered personal effects to surviving family members if the artifacts definitively can be associated with a particular individual. In the case of this wristwatch, it is impossible to tell to whom it belonged onboard the aircraft. There were a total of 13 people onboard the helicopter when it crashed, which includes eight Americans. It is unlikely that the Caravelle watch belonged to one of the Montagnard allies or the North Vietnamese prisoners. However, as the watch was not directly associated with any recovered remains and did not have any personal markings, it cannot be attributed to any particular American onboard the flight. However, this may not be the case for all wristwatches.

The purchases of expensive brand watches, like the purchase of a new automobile, are usually recorded by the manufacturer. Upon purchase, it may be recommended that the customer take out an insurance policy on the watch, in which case the customer’s name and contact information is registered along with the watch’s serial number. A review of an expensive watch’s serial number (which will be inscribed somewhere on the watch) and the manufacturer’s archives may reveal to whom the watch was sold. Provided that such a watch was not sold by, given away by, or stolen from the original owner, it may be returned to surviving family members even when not recovered in direct association with their remains. More importantly, when found in association with remains, the archival review may actually assist in the identification process (3,4).

While the case presented is that of a 35-year-old aircraft crash, automatic watches may be useful in contemporary murder cases. To emphasize this point, the first author was introduced to the potential of automatic wristwatches to establish the dates of executions while excavating mass graves in the former Yugoslavia (5). During these excavations, Seiko brand quartz automatic watches, apparently very popular in the former Yugoslavia, were regularly recovered. These particular types of watches are slightly different from the Caravelle watch’s automatic mechanical movement in that

the Seiko's rotor is magnetized and generates electrical energy that is stored in a capacitor which then powers the watch's action (6). These Seiko watches have a run-down time of *c.* 36–48 h, but as discovered by accident during the mass grave excavations, further movement of these watches after recovery restarted their actions (5). The ability to restart by handling is not necessarily an ability shared by all automatic watches. When an automatic watch brand is encountered, it is suggested that the manufacturer be contacted to establish the estimated wind-down time and to acquire an explanation regarding its particular movement.

### Conclusion

Sometimes a piece of evidence, considered inconsequential at first glance, ends up making a significant contribution to a case. This article presented a case where an automatic timepiece helped to correlate an excavated Vietnam War era helicopter crash site with the reported loss incident, and provided a line of evidence to support the identification process. If the watch had been battery operated, then the date and time would not be a reliable indicator as there is no telling how long the battery would last. By knowing approximately how long an automatic watch takes to run-down, these timepieces are useful items of evidence that can narrow down the timing of a clandestine event. Differences in wind-down times and operations are likely between watch manufacturers and particular models. It is suggested that if an automatic watch is to be used to establish a time frame, then the manufacturer be contacted

regarding the movement and wind-down times of the timepiece in question. In a case with no ostensible lines of evidence available for a strong correlation, a single piece of evidence, which in most instances would be deemed circumstantial, was able to significantly correlate a reported loss incident with an aircraft crash site from the Vietnam War.

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