

More Woeful Delights

FORENSIC SCIENCE AT THE CINEMA, THE SEQUEL

James E. Starrs

PICKING UP WHERE we left off, see *Woeful Delights*, 4 GREEN BAG 2d 409 (2001), at the end of Category 2: Hollywood Just Frolics With Science ...

CATEGORY 3: HOLLYWOOD HITS THE SCIENTIFIC MARK

Sometimes, but only rarely, Hollywood gives forensic science the benefit of the doubt and presents it in a credible fashion. Arguably Hollywood can produce films with forensic science depicted accurately without sacrificing the interest of the viewer in the unfolding drama.

In *Star Trek VI: The Undiscovered Country* (1991), for example, two assassins board a space vehicle, disabled in zero gravity conditions, and send blood flying as they shoot up everyone in sight. The shape of the blood drops is spherical in nature as it should be both in

space and on earth, even under the pressure of gravity. Gravity, or the lack of it, has no effect on the geometric shape of liquid droplets. With or without gravity such droplets are round balls, not tear-shaped, a vitally important recognition in crime scene reconstructions from the interpretation of blood spattering.

Two true-to-forensic science movies are *Call Northside 777* with Jimmy Stewart and Lee J. Cobb and *Allegheny Uprising* with John Wayne and Claire Trevor. Unfortunately for today's movie-goers both of these films are dated, the first having hit the silver screen in 1948 and the latter even earlier, in 1939.

Call Northside 777 (1948) – Photography

Jimmy Stewart, playing a Chicago reporter, needed considerable convincing to believe that Frank Wiecek, acted by Richard Conte, was

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innocent of the killing of a police officer in this suspenseful murder mystery. Wiecek, having served eleven years of a life sentence, had a mother who never gave up hope in her son's vindication.

Her newspaper advertisement, offering a \$5000 reward for information about the true killer, came to the attention of an at first skeptical newspaperman, Jimmy Stewart. But, as his open-minded investigation progressed, fueled by the free hand his editor, Lee J. Cobb, gave him, he became a fervent believer in Wiecek's innocence.

The proof of Wiecek's innocence came from a photograph in which a newspaper appeared inconspicuously. Enlarging the area of the photograph showing the newspaper enabled Stewart to demonstrate the date of its publication, proving that the state's chief witness at Wiecek's trial had given false testimony.

With today's satellite photography it is hard to conceive of a 1948 vintage photograph providing the tell-tale clue to solve a murder. Yet the same magnification of a small segment in a photograph taken today would be the method of choice in enlarging a photograph piecemeal, except that contemporary digital photographing would permit enhancement unrecognized in 1948.

Allegheny Uprising (1939) – Firearms: Muzzle to Target Distance Testing

John Wayne and Claire Trevor join in this pre-Revolutionary War drama demonstrating how a courtroom firearms experiment, properly constructed at a murder trial, can prove that an eye witness to a killing is lying. The muzzle to target distance determination, visually illustrated by the courtroom demonstration, is scientifically valid except for the lack of proof that the propellant charge in the courtroom flintlock rifle was similar to that of the rifle

allegedly used by Wayne to commit the unprovoked murder for which he was on trial.

In the courtroom experiment John Wayne's black powder muzzle-loading rifle is used when, in fact, Brian Donleavy, who was really the killer, employed his own distinctive gun to do the dastardly deed. This is a difference Hollywood does not take into account, nor does it take due note of, nor seek to explain, the lack of the victim's back-spattered blood on his jacket front at the site of the entrance wound.

However, in fairness to Hollywood, blood does not have to back-spatter from an entrance wound, especially where clothing covers the impact site and if back-spatter does occur it would be projected away from the garment, not onto it.¹ Passive bleeding (bleeding after the heart has stopped pumping) could, of course, cause blood to soak into the area surrounding the wound but this would not be interpreted as back-spatter by one experienced in bloodstain pattern interpretation. These are nuances of forensic science significance which are alien to Hollywood's more slap-dash way of handling such matters.

CATEGORY 4: JUST PLAIN WRONG SCIENCE

Three Days of the Condor (1975) – Firearms: Gunshot Residues

In this "B" movie peopled by prominent Hollywooders, Robert Redford plays a CIA clerk caught up unwittingly in a CIA massacre of its own people. At the movie's beginning, before the massacre, the conversation in the CIA's safe house is all about a killing in which the bullet hole in the body is said to be "characteristic" of a .38 caliber bullet. But the caliber of a bullet cannot be determined so exactly from

¹ V.J.M. DiMaio, *Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques* (CRC Press, Inc., Boca Raton, FL: 1993), p.209.

the size of the wound in flesh. The flexibility of flesh during and after sustaining a penetrating wound from a bullet prevents any certain assessment of the size of the entering bullet.²

Redford escapes the massacre only to become a fugitive wanted by a CIA hit man, played by Max Von Sydow. Von Sydow catches up with Redford just as Redford corners the "Big Cheese", learning from him that the plot and the killings were Middle-East-oil generated.

Von Sydow shoots the CIA higher up whom Redford has flushed out. The killing is by a bullet to the right temporal region from near-contact range in an execution-style fashion. Von Sydow then seeks to palm off the murder as a suicide by wiping the adjacent desktop area clean of latent fingerprints and by placing the gun in the victim's right hand. But what if the deceased was not right-handed? It is known that about 85% of the population is dextral and it is also known that right-handed suicides typically hold a gun in their dominant hand, not ipsi laterally. Chances are, therefore, that the fatal bullet wound and the gun being found in the right hand would not generate law enforcement suspicions of foul play. More importantly, there would not be any primer residues on the back of the victim's firing hand. The absence of such residues would alert the police to the idea that the death is not a suicide (*felo de se*). Of course, this assumes the police were smarter than Hollywood and would swab the victim's hands for traces of gunshot residues.

The Morning After (1986) – Pathology: Livor Mortis

Jane Fonda got a Best Actress nomination for

her portrayal in this movie of a washed up actress, boozing and sleeping around non-stop. One morning after an alcohol drenched all night affair, she finds herself in bed with a porno king, lying supine and quite dead with a knife imbedded in his left chest.

Fonda runs from the scene in much distress but returns hours later to tidy up, being then much more composed. She cleans up fingerprints and blood, pulls the knife out of the deceased's chest evoking an audible sucking sound (*why?*) and turns him over to a prone position (*why?*). The deceased's legs show the onset of rigor mortis but his posterior does not reflect, as it should, the purplish discoloration characteristic of the post-mortem pooling of blood to the dependent portions of the body, an indication of death termed *livor mortis*.³

All becomes well when Jeff Bridges arrives at the scene to save Fonda from her wayward ways, to keep her from the law's clutches and to convince her to dump the evil-minded Raul Julia, playing the role of her husband.

Beverly Hills Cop II (1987) – Fingerprints: Superglue

Eddie Murphy, the Detroit cop on leave in L.A., is out to solve the "Alphabet Crimes", a skein of violent robberies in Beverly Hills. In his investigations (more properly, shenanigans), he discovers a box of intact matches inside the burnt out inferno of a car (what, the matches survived the conflagration?) and tests the matches for fingerprints using super glue in a terrarium.

He visualizes the prints but he does so much too quickly, without the terrarium's clouding up from the fumes emitted from the heating of the superglue and with the print showing up in

² Id.

³ Livor mortis, also called post-mortem hypostasis, is caused by the accumulation of blood in the small vessels of the dependant area of the body. The location of such an accumulation can be changed if the body's position is altered prior to the lividity's being fixed at about eight hours after death. D.J. DiMaio @ V.J.M. DiMaio, *Forensic Pathology* (CRC Press, Inc., Boca Raton, FL: 1993), pp.21-26.

black instead of white as it should after being exposed to superglue fumes. Also he explains superglue as attracted to bodily acids, rather than oils, and reacting to them. Further, he uses superglue inappropriately on a paper matchbox, a porous substratum, rather than as it is intended to visualize latent prints on non-porous surfaces.⁴ Otherwise the movie is a (painful) scream.

**The Vanishing (1993) –
Toxicology: Chloroform or Ether**

Jeff Bridges plays the role of a psycho chemistry professor à la Ted Bundy (he wraps his arm in a sling to gain sympathy from unsuspecting victims) who is out to anesthetize and kidnap his victims and then bury them alive. The movie is a remake, and a banal imitation at that, of a 1988 Dutch film entitled *Spoorloos*.

Kiefer Sutherland, no extroverted *Young Guns* predator here, becomes one of Bridges's victims as he seeks to learn the fate of his girlfriend who had been done away with by Bridges some three years before. After Sutherland is buried alive by Bridges, Sutherland's new love smokes out Bridges and confronts him in his lakeside cottage. But she almost collapses from the fumes in a poison-soaked rag hidden in a telephone at the cottage when she attempts to make a call for help. (Why Bridges put it there is not explained since he did not suspect he was being shadowed.)

The plastic phone should have melted away since, whether chloroform or ether was hidden in it, they are both powerful enough to liquefy the plastic of the phone. Also, the smell of either would have been a dead give away that something was amiss. The vertiginous reaction of Sutherland's girlfriend to the fumes

from the phone was too quick acting for either chloroform or ether to have been the active ingredient.

Reviewers tend to call the substance used by Bridges chloroform but the fire in the car in which Bridges traps the girl is so instantaneous and explosive as to make it appear to be ether that Bridges was using.⁵ But the plot is aflame with too many incongruities to call the toxic substance either chloroform or ether with any degree of certainty.

**Die Hard 2 (1990) –
Pathology; Fingerprints; Firearms**

Another Bruce Willis bloody, action-filled extravaganza set at Dulles Airport in the suburban Virginia countryside. Willis is awaiting the airplane arrival of his wife, Holly, who plans to spend Christmas with her family in the Virginia suburbs. The telephone at this airport used by Willis to call his wife on the incoming airplane (can you do this?) clearly says Pacific Bell (not Bell Atlantic as it should be). The captain of the airport security forces castigates Willis for violating D.C. regulations at the airport even though D.C. has no jurisdiction over Dulles Airport. Only Virginia or the Feds do. But these gaffes only jump start this abundantly miscued film.

Willis tells the airport's security chief that terrorists are using a Glock 7, but there is no such weapon. He might have had in mind a Glock model 17, which Willis says is made of porcelain, thus being able to avoid metal detectors. Wrong. The gun must be partly plastic with detectable metal parts, since there are no commercially available wholly plastic or porcelain weapons. To make these gun mishaps worse, the gun in question is said to be

4 F.G. Kendall & B.W. Rehn, "Rapid Method of Super Glue Fuming Application for the Development of Latent Fingerprints," *J For Sci* 1983, 28(777); R. Saferstein, *Criminalistics, An Introduction to Forensic Science* (5th ed.: 1995), p.428.

5 D. Elley, editor, *Variety Movie Guide-'96* (Reed Consumers Books Ltd., London: 1995), p.778. In general, see L.J. Casarett & J. Doull, *Toxicology: The Basic Science of Poisons* (MacMillan Publishing Co., NY: 1975).

made in Germany, but Glockes are made in Austria.

Still more errors, in the applications of forensic science, await the viewer. Willis rolls the fingerprints of a terrorist he has killed in a subterranean shoot-out at the airport. The fingerprinting occurs just moments after the killing but rigor mortis is already seen to be becoming fixed on the dead body. The onset of rigor mortis, generally occurring six to eight hours post-mortem, must have been instantaneous, which is scientifically implausible, unless the body suffers a cadaveric spasm (instant rigor mortis), a very rare happening at the time of death.⁶

Moreover, the fingerprinting is done by Willis with a borrowed stamp pad and without making any effort to roll the fingers so as to obtain the entire digit's friction ridges, as would be the normal course in obtaining fingerprint exemplars. Following this bungled fingerprinting, Willis faxes the prints back to California for a computer check of their identity. The quality of the minutiae of the friction ridges after stamp pad rolling and faxing would most assuredly have been inadequate for an identification of the prints, but one was forthcoming nonetheless. The forensic science hokum in this movie is on a par with its plot-twisted daffiness.

Basic Instinct (1992) –

Drugs; Pathology; Polygraph; Firearms

At the outset of this erotically charged brew, a wealthy politico is seen to be knifed to death during sexual intercourse with an unidentified

blonde. That sets the stage for this visceral murder mystery. At the crime scene policeman Michael Douglas listens to a pathologist with a thermometer in hand giving his estimate of the time of death after reading 92 degrees on his thermometer. According to the pathologist's wild speculation the death occurred six and a half hours (plus or minus) before the thermometer reading. There was no showing of what part of the body the temperature reading was taken from. There was no demonstration that the ambient temperature was measured or that the decline in body temperature over time was measured and contrasted to the ambient temperature.⁷

The neglect of Hollywood's medico to consider the air temperature at the place where the murder victim was found was another failure to take into account one of Newton's laws. It bears recollecting that, under Newton's law of cooling, the rate at which a body loses heat to its surroundings is proportional to the temperature difference between the body and its surroundings.

Douglas sees a suspicious substance at the scene of the crime and, *mirabile dictu*, immediately identifies it as cocaine. (Was it cocaine in the crystalline form or crack?) How Douglas performed this scientific feat macroscopically is left to the viewer's imagination, which would require discounting his reliance on reagent testing at the scene or chemical analysis through laboratory testing. His judgment call deserved less of a hearing than an inoperative smoke-detector.

Stone is arrested, interrogated, polygraphed

6 W.H. Spitz, editor, Spitz and Fisher's *Medico Legal Investigation of Death* (3rd ed., Charles C. Thomas, Springfield, IL: 1993). This volume explains cadaveric spasm as "in rare instances, a forceful agonal contraction or seizure is converted almost immediately into tight rigor without preceding primary flaccidity." The triggering mechanism is generally extreme fright or tension. See also L. Adelson, *The Pathology of Homicide* (Charles C. Thomas, Springfield, IL: 1974), pp.166-167, where cadaveric spasm is referred to as "instantaneous rigor" and "cataleptic rigidity."

7 The subject of algor moris (the cooling of the body after death) is addressed at page 734 in A.A. Moenssens, J.E. Starrs, C. Henderson & F.E. Inbau, *Scientific Evidence in Civil and Criminal Cases* (4th ed., Foundation Press, NY: 1995).

and passes the polygraph. But she is polygraphed inappropriately with her legs crossed (cutting off circulation in her body but bringing it to a boil in her viewers). Only one polygraph run is conducted, which is well below the norm for legitimate testing. No time is taken to evaluate the run by the polygraphist, which falls afoul of the usual procedure, nor is the polygraph chart re-evaluated by a second polygraphist. Stone smokes in the polygraph room, which is patently a no-no, and lets herself loose of all controls. All of these actions constitute extreme departures from the ordinary procedures in polygraph testing.

Four more homicides follow, the first one of the four being a fellow officer. Douglas' police side-kick says the shot to the deceased officer's head was caused by a .37 caliber revolver and demands to be handed Douglas' gun, Douglas having become a suspect. The gun is smelled by the officer to see if it bears the odor traces indicative of a recent firing. But whereas the murder weapon was said to be a revolver, Douglas hands over for inspection a semi-automatic. There is a major difference between a revolver and a semi-automatic but hush, don't tell Hollywood's film makers, that might destroy this viewer's lambasting fun.

Presumed Innocent (1990) – Serology

This movie is Hollywood's version of Scott Turow's 1987 murder mystery of the same name. In it, Harrison Ford, as D.A. Rusty Sabich, narrowly avoids a conviction for the murder of a fellow prosecutor with whom he has been having a meretricious affair. The victim is found dead, her head having been bludgeoned with a blunt instrument. Semen is found in her vagina but the sperm are said to be dead. The A-B-O blood type of the semen is the same as Rusty's. A drinking glass, with his fingerprints on it, is taken from the victim's

apartment and secreted away by Rusty's police buddy.

The incriminating glass never finds its way into evidence at the trial. Much is made of the importance of the fingerprint-laden glass. But the glass need not have been associated with the time of the killings since Rusty might have placed his fingerprints on it at some earlier time when he was visiting the murder victim. Forensic science currently has no known method to time date when fingerprints were placed on an object.⁸ So what's all the fuss in the movie about the glass and the fingerprints?

The plot unravels and all is disclosed when Rusty returns home to find a hammer in his tool box with blood on the action end. The blood is bright hemoglobin red, as if it were fresh, when it should have discolored to brown over the lengthy time period since it was used in the murder. The rug in the victim's apartment is also bright red, it too showing no signs of having been discolored by aging.

Of course the movie is dated by not having recourse to DNA-testing to solve the whodunit. But DNA would have made short work of the mystery puzzle in the same way as fingerprint matching. Neither one can prove Rusty's guilt, only that he was at some undetermined point in time present at the murder scene.

Jagged Edge (1985) – Typewriter Identification

In this hard-boiled murder mystery, Glenn Close, playing a defense attorney, successfully defends Jeff Bridges for the killing of his wife. Bridges' alibi is proved to be air-tight when Close quite inexplicably finds a typed note next to her telephone in her office which enables her to save Bridges. After Bridges' acquittal Close and he engage in passionate sex as the precursor to a long romantic relationship. The morning following their big celebratory night

8 J.E. Starrs, "Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed the Bounds," *Crim L Bull* 1999, 35(3), pp.234-276.

together, while Close is still in the afterglow of her new found love life, she discovers a typewriter on the top shelf of Bridges' bedroom closet, hidden behind some linens. It is a Corona portable.

Close, remembering the critical typed note, which got Bridges off at his murder trial, takes the typewriter down and types out the key words from the note in which it is said "he is innocent." The "t" in the word innocent hits high just as the "t" in the note did. That convinces Close that Bridges is guilty even though many Coronas could show the same defect from use and wear resulting in loosening the "t" bar. For her to be convinced of Bridge's guilt on this slim evidence and for her to throw over her new-found love just for that reason does not ring true.

Feeling herself duped, Close sets up a confrontation in which the masked killer breaks into her house, and approaches her with a knife as she lies in bed. But she is prepared with a gun under the bedcovers. She shoots and kills her attacker. Upon the unmasking, she is proved to have been right. It was Bridges after all.

At the end of the movie, the knife's jagged edge is shown with the knife's position in Bridges' hand having been reversed from the position in which he held it upon entering Close's bedroom. Did Hollywood need a better photographic effect? Rather it needed something more than the "t" on the Corona typewriter for Bridge's guilt to have been satisfactorily demonstrated. The movie, in this regard, was not credibility-friendly.

Jurassic Park (1993) – DNA

Steven Spielberg orchestrated a cinematic tour de force in the 1975 movie *Jaws*. *Jurassic Park* can justly be called a repeat performance. In it Michael Crichton's bestselling book is adapted by Spielberg and Crichton to offer the maximum spine-cracking tension and blood-curdling shock for those who champion

watching a movie while slipping further and further down in their seats. The movie exploits the uses of recombinant DNA and DNA cloning beyond their limits, both presently and in the foreseeable future. The DNA of a dinosaur is found in a fossilized mosquito preserved in amber. The DNA is extracted and used to create living dinosaurs of many different varieties. (There is no showing that the DNA of many fossilized mosquitoes had been discovered.)

The process by which this cloning was accomplished is explained in a short cartoon-like tutorial which is replete with bogus or unprovable scientific assertions. It is said that there are three billion base pairs in a dinosaur's DNA, for example. But how is this to be known so definitely without having obtained known exemplar DNA from a dinosaur against which to compare the amber-embedded, mosquito-trapped DNA in this fantastical tale? It is one thing for scientists to duplicate the dead, but intact DNA of a dinosaur. It is wholly another to infuse the life force into the duplicated DNA. The movie fails to explain the method by which that was done. If living dinosaurs can be crafted from dead DNA molecules, then what is to stop the reincarnation of multiple Jesus Christs from the Shroud of Turin, assuming it possesses the DNA of Jesus Christ.

Judge Dredd (1995) – DNA & Surveillance Photography

Sylvester Stallone presides over a futuristic plot, first appearing years ago in the British comic magazine *2000 A.D.* Stallone, as Judge Dredd, whose despotism parallels that of the fabled Judge Roy Bean, is out to stop the criminal element which is running rampant in the metropolis of Mega-City One. But his nemesis, Rico, escapes from prison and commits two murders which are then pinned on Stallone.

Stallone is tried and convicted even though the surveillance video of the crime is excluded as insufficiently clear to pinpoint him as the

murderer. (You would think that a futuristic society would have learned how to digitize a surveillance film sufficiently to augment its clarity to the point of near perfection.)

Notwithstanding the videotape's being kept out of evidence Judge Dredd is convicted because his DNA is found on the bullets which killed the victims. (The expert on the video is in court but testifies through the medium of an affidavit. The expert and his affidavit are unnecessary since the jury can see for itself from the film that it is unable to identify the perpetrator with any degree of precision.)

The process of getting Dredd's DNA and impregnating it in a ring around the bullet as the cartridge is chambered, is explained with a graphic illustration. The DNA on the fired bullet is then compared to his DNA which had been data-banked.

No explanation is offered on how Stallone's DNA was unique to him and no one else without any statistical work-up. Was direct sequencing the means of associating him?

Also, his DNA is said to have been obtained from the grip of the gun as each round was chambered but why not impregnate his DNA into all the bullets ordinated to him in advance? This would follow the pattern of the DNA personalized ink that is starting to hit the market for persons willing to be exploited. Nothing is said about the improbably impregnable qualities attributed to DNA, giving it the ability to withstand the shock and the percussion of being fired from a high powered gun and striking the body, possibly the bone as well, of a victim.

All is not lost, however, by the trumped-up conviction of Stallone. He manages to escape from prison and takes on a one-man crusade to put a stop to the evil doings of the mad and maddening Rico, but nowhere near

as infuriatingly mad-cap as are the scientific underpinnings of this movie.

It would be some meager solace to say, as the Warner Brothers cartoons do, "That's All Folks!" but the above listing just dusts the surface of Hollywood's movies which are so scientifically flawed that they can rightly be denominated Hollyweirds.

AFTERWORD

The Patriot (2000) with Mel Gibson in the lead role as Captain Benjamin Martin is Hollywood's recent breast-thumper and cinematic crowd-pleaser. Before the action really commences, Gibson visits the grave of his wife located on his farm in rural South Carolina near Charles Town. She apparently died during childbirth three years earlier in 1773. Her gravestone reflects the bare facts of her life and death.

The problem, for the viewer who is persnickety about his science, arises from the positioning of the grave. The grave's location is marked by a gravestone, which is therefore not a cenotaph, and which is placed cheek-by-jowl beside a tree of considerable maturity. The root structure of such a tree would have made it a formidable and forbidding task to dig a grave right next to the massive trunk, especially when there was abundant open space beyond the spreading branches of the tree. Yet one can appreciate the picturesque scene the movie's cameraman sought to capture, requiring Hollywood to bend reality to achieve such a compellingly dramatic visual effect, setting a quiet and somber stage for the fury of death and destruction that was soon to follow. Sometimes, even this reviewer will admit, the mundanity of the scientific way should give way to the rightful demands for movie-going entertainment. *JB*