

Letters to the Editor

The "Piggyback" Bullet

Sir:

The interesting report of Sexton and Hennigar [1] describes unusual instances of missile collisions within the human body.

Such collisions are brought about by the impinging of a second projectile against one previously lodged in the tissues. The trajectory is often at an angle of less than 90 deg. Another unique firearms injury relates to the tandem or "piggyback" bullet. This missile represents two bullets united in their long axis, either within the discharged weapon or in their corporeal course. When such a projectile enters the skin, it may separate into two diverse missiles that pursue individual pathways through the deeper structures. This division may be associated with a tumbling action that greatly augments the destructive effect of each. These bullets appear to dissipate energy rapidly as they traverse the body; an exit wound is frequently lacking. Hence, the examining pathologist is confronted by the puzzle of two bullets, sometimes widely dispersed, with a single wound of entry.

Injuries of this nature have been documented [2,3] in cases in which the tandem missiles were discovered lying together like "peas in a pod" in the cranial cavities of the victims.

Occasionally, tandem bullets may separate within the body. A .38-caliber bullet was found lodged subcutaneously in the chest of a 15-year-old boy after it had traversed the heart and both lungs. A second bullet was recovered in the center of the brain. An entrance wound was observed at the inner angle of the right eye, surrounded by sufficient tattooing to establish a close firing range. Subsequent examination of both projectiles determined that the bullet in the chest wall had an indentation in its base that fit well over the tip of the one lying in the brain, evincing that the two missiles had, in fact, been joined together during their trajectory [4]. A tandem bullet wound in the parietal lobe of the brain was reported by LeMoyné [5], and a similar one subsequently by Gonzales [6].

Faulty ammunition that causes misfiring of a cartridge can cause a bullet to stick in the barrel of a gun, to be carried forward into the victim upon the tip of a second bullet fired by a powder charge of better quality [7]. The possibility of an increased wounding effect from a single shot has prompted the manufacturers of military ammunition to produce tandem cartridges containing two projectiles mounted together in their long axis. The posterior bullet has a base, slightly eccentric to the long axis, purposefully designed to effect separation before entrance into the body, thus inducing a destructive ability much in excess of that associated with most single bullets.

Though sufficient evidence is lacking, one might speculate on the kinetic consequences of two missiles traveling together in the same course. Energy may be much expanded [8]. The resultant tissue damage will reflect this increase.

In tandem wounds, the retrograde deflection of exploding powder by the first bullet, lodged in the gun barrel, may diminish the total striking force of both projectiles, thereby reducing the observed tissue injury to a level below that anticipated in such a situation.

It is becoming apparent that, as in other areas of pathology, gunshot wounds do not always fit into a "textbook picture."

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References

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SIDS—Continued

Sir:

A letter to you from Kenneth H. Mueller (Vol. 23, No. 4, Oct. 1978, p. 633) implied quite clearly that your standards for publishing a paper should be "a little higher," with direct reference to a paper by Raven et al (Vol. 23, No. 1, Jan. 1978, pp. 116-128).

May I suggest that pathologist Mueller consult the classic pathological studies on sudden unexpected death in infants, published in 1947 in the *American Journal of Public Health* by Dr. Jacob Werne and his associate Dr. Irene Garrow. Briefly, they reported 167 consecutive cases of infants allegedly suffocating in crib, carriage, or bed. Microscopic study revealed fulminating respiratory disease in the great majority of instances.

I hesitate to refer to a paper, "Sudden Death in Infants Due to Pneumonia," published in the *Journal of Pediatrics* (Vol. 23, 1943, pp. 189-193) by this author before the term SIDS was invented. I do so only to refer again to Jacob Werne, whose published studies in the *American Journal of Pathology* (Vol. 18, 1942, p. 759) were cited, as were others on this subject by S. Farber (*New England Journal of Medicine*, Vol. 219, 1938, p. 836) under References.

Published reports and slides by Raven have been reviewed by me and serve to confirm previous studies reported from Coroners' Offices in New York City (Jacob Werne), in Detroit, and in Los Angeles. I commend you highly for publishing the known facts regarding the pathology of SIDS.

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Sir:

Thank you for the opportunity to respond to the letters of Dr. Raven (Vol. 23, No. 4, Oct. 1978, pp. 633-634), Dr. Ackermann (Vol. 23, No. 4, Oct. 1978, pp. 634-635), Dr. Valdes-Dapena (Vol. 24, No. 3, July 1979, pp. 539-541), and Dr. Adams (Vol. 25, No. 2, April 1980, pp. 000-000).

I wish to thank Dr. Raven for admiring my rhetoric; on reflection, my letter now seems, to me, to be bombastic and perhaps a little obscure.

I wish to thank Dr. Ackermann for pointing out the significance of bound IgG in the

lungs of some babies who died suddenly and unexpectedly. His justification of these cases as SIDS victims—they were “officially designated by medical examiners as SIDS”—is a little worrisome inasmuch as only a generation or two ago similar cases were being “officially designated” as cases of suffocation or status thymicolymphaticus.

I wish to thank Dr. Valdes-Dapena for clearly outlining the present status of SIDS research and for pointing out that the conventional category of SIDS is in the process of being dismantled and rearranged owing to the recent findings of occult morphologic and subtle physiologic abnormalities in at least some of these babies. For her comments on “procrustean,” I say, “You’re welcome.”

I wish to thank Dr. Adams for reminding us of the outstanding contributions of Werne and Garrow, who convincingly demonstrated that these babies had *not* suffocated, and for pointing out my lack of humility. Being proud of my humility is a subtle vice that needs my constant attention.

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Discussion of “Criminalistics—A Look Back at the 1970s, a Look Ahead to the 1980s”

Sir:

I read with interest and enjoyment Dr. Saferstein’s article on the past, present, and future of forensic science (Vol. 24, No. 4, Oct. 1979, pp. 925–930). If not exhaustive, it certainly provides food for thought. I was disappointed, however, to find that no mention had been made of the increasing role of forensic science education in the future of forensic science. Having worked “both sides of the street” as a practicing forensic scientist and now as an educator in forensic science, I have gained a perspective on the changing role of education in the field. In 1969 there were some half-dozen colleges that offered degrees in forensic science. Now the list exceeds 30 and is rising all the time. The impact of this increase in applied education on the field of forensic science has not been measured. In the future, as more graduates of a forensic science program become available to forensic science laboratories, the impact will most certainly be profound.

The field of forensic science education is not without its problems also. These problems must also be addressed in the 1980s if meaningful undergraduate and graduate education is to continue. The money crunch has hit the universities too. Funding has become scarce. The move towards certification must include educational facilities to insure that some minimum standards are being met. Some programs offer a degree in forensic science when the student has taken little more than a B.S. in chemistry and a short internship. These pretenders should be weeded out.

I believe that increased education can only help forensic sciences in the 1980s. We must all recognize that and work together. Our national meetings should reflect this by offering symposia and even a separate section on education. The effects of laboratories and colleges working together can be synergistic.

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Author's Reply

Sir:

I cannot dispute Dr. Siegel's contention that forensic science educational programs have a role to play in the forensic science profession and in criminalistics in particular. Dr. Siegel's letter raises some interesting points and could itself be the subject of a detailed paper. However, without being too verbose, let me summarize my feelings on the subject:

1. For forensic science academic programs that hope to justify their existence solely on the expectation of making manpower contributions to forensic science laboratories, this dream will come to an abrupt end in the 1980s. Declining student enrollment in colleges coupled with declining employment opportunities in the forensic sciences will weed out weak academic programs more effectively than any certification program.

2. Dr. Siegel's suggestion for conducting symposia on forensic science education at national meetings is a good one and has already been implemented. For example, such a symposium was conducted at the last AAFS meeting in Atlanta, Ga. The Academy also has a standing committee on education to coordinate its activities with the forensic science academic community. Currently, Dr. Jesse Bidanset of St. Johns University serves as its chairman.

3. In keeping with the central theme of my paper, I believe the ultimate value of forensic science educational programs to our profession rests with their willingness and ability to undertake serious research. Academia has a vital role to play in this regard. Indeed, I firmly believe that the progress of forensic science in the United States in the 1980s is inextricably linked to successes at supporting academic forensic science research programs. Present levels of fundings are a national disgrace. Leaders from all segments of the forensic science community must make this sad situation known to the general public and government officials and all avenues must be pursued to secure adequate financial support. The Law Enforcement Assistance Administration has been and, I hope, will continue to be a source of funding, though up until now funds have been woefully inadequate. There is no valid reason why our profession must continue to be excluded from other federal sources of support normally available to research programs in the natural and physical sciences. It's imperative that forensic science education leaders begin to select effective spokespeople who can espouse and lobby for their objectives.

Thank you for the opportunity to reply to Dr. Siegel's letter.

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Discussion of "Identification of Mass Disaster Victims: The Swiss Identification System"

Sir:

I have just read the article, "Identification of Mass Disaster Victims: The Swiss Identification System," by Mühlemann et al (Vol. 24, No. 1, Jan. 1979, pp. 173-181). It seems to me that American insurance carriers would hardly accept a disk ID as "positive identi-

fication" without further comparison of antemortem and postmortem records. From a legal standpoint, with reference to collusion, I can think of a number of reasons why an ID disk could be planted on a victim.

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Discussion of "The Individuality of Human Footprints"

Sir:

Caution must be exercised by forensic scientists in applying the concept of "individuality of human footprints" set forth by Dr. Robbins in her article of the same name (Vol. 23, No. 4, Oct. 1978, pp. 778-785).

Footprints are indeed different from individual to individual; we know this without ever seeking to compare one with another. Given sufficient individual detail, whether in the form of friction ridges, scars, or wrinkle patterns, a footprint or even a partial footprint can be identified as coming from one and only one source.

Dr. Robbins offers the idea that *in the absence of the individualizing detail of this type* footprints are still unique with respect to their morphology, but she leaves us without the pertinent information necessary to accept the idea, put it to use, or abandon it in the forensic sciences. We need to know how much variation can occur between consecutive footprints of an individual, and we need a means of measuring this variation. Further, we need to know how much variation occurs among many different individuals having approximately the same foot size. This variation should be measured in the same manner and in this way, given sufficient data, the proper initial steps will have been taken to assess the significance of the results of the comparison between an evidence footprint and that of a suspect.

How much variation is allowed before one can form an opinion of exclusion? What is the significance in failing to exclude the suspect as possibly having made the evidence impression? How closely do two impressions have to correspond before they can be identified as originating from the same individual? These are the important questions for forensic scientists, and they are the questions we should seek to answer *before* accepting the validity or applicability of the concept presented by Dr. Robbins in her article.

There is no doubt that Dr. Robbins has a head start in the gathering of data to answer our questions. Common sense and some experience tell me that the centimetre grid measurement and morphology description approach of Dr. Robbins are not the methods of choice in looking at footprints for comparison purposes, due to a lack of sensitivity. A photographic overlay technique would seem to be more appropriate, because it automatically takes into account certain morphological contours that are difficult to put into words or categories. The amount of noncorrespondence between footprints can be easily quantified by using an overlay technique.

We would ask Dr. Robbins to direct her efforts in this area to the development of a solid data base from which to approach the problem of individuality of footprint morphology and to readdress the Academy and *Journal* with her methods and findings.

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