

## Letters to the Editor

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### **Black Talon**

Dear Sir,

In response to the controversy surrounding the Black Talon cartridge and its supposed danger to medical and support personnel, we at the Forensic Science Laboratory at Colorado State University conducted preliminary tests of said cartridge.

For those who are not aware of the Black Talon round, or the debate it has caused, some background information may be in order. In 1992, Winchester-Olin introduced a new type of hollow-point ammunition with a reverse-taper jacket design made to form petals upon expansion. The ammunition was quite popular until controversy ensued about the capability of these petals to cause harm. A few surgeons and pathologists entered the fray expressing this concern [1,2]. Additionally, persons with a nontechnical background have suggested that the ammunition also had the capability to defeat soft-body armor worn by law enforcement agents. Consequently, rather than trying to defend its product, Winchester stopped production of the ammunition and reserved future manufacture for law-enforcement sale only.

Our testing was conducted with a M1911 pistol in .45 ACP caliber with corresponding Black Talon ammunition. The flesh simulant used to test expansion and retrieval of the bullets was Duxseal, a malleable putty material comparable to human flesh at 70° F. The soft body armor samples used were fastened securely to a thick catalog enclosed tightly within a cardboard box, and then fired at.

Our first concern was to test the capacity of the expended bullet to puncture or lacerate flesh. After firing into the flesh simulant the bullet was recovered by simulated surgical technique consistent with the extraction of a bullet through a wound track. It was determined that careful, gentle probing consistent with proper surgical standards resulted in neither the latex gloves nor the hand of the experimenter being cut. In fact, only after gross heavy handed extraction were the gloves punctured. In no case did any handling of an expended bullet cause a puncture or laceration of the skin.

We at the laboratory suggest that the whole issue of the capacity of Black Talon to cut flesh may be circumvented by using a portable X-ray machine and forceps. The X-ray would leave little doubt as to the location of the expended bullet, thereby saving time and effort in blind probing. The forceps would eliminate contact of hands on the bullet, giving the individual no chance of being cut. We submit this is a logical method of dealing with a gunshot wound case where the bullet must be extracted.

Our second test involved the allegation that Black Talon was capable of penetration of soft body armor commonly worn by law enforcement agents. Swatches of material were obtained from Second Chance Inc., in both II and IIA threat levels. The Kevlar material stopped Black Talon rounds even at near point blank range. As an additional control, full metal jacketed rounds were also fired at the material, and also did not penetrate. The fact that the Black Talon is a hollow-point cartridge and is designed to expand, not penetrate did not seem to occur to proponents of this theory.

In summation, Black Talon ammunition is simply a carefully engineered, quality hollow-point round. It was designed to perform well on the criteria set forth by the Federal Bureau

of Investigation. Table 1 demonstrates the ammunition's performance under these guidelines [3]. There is nothing extraordinary about its capabilities, it should be treated accordingly. The debate whether this particular round may cut the hand of a pathologist is immaterial; the question should be whether proper precautions are taken to reduce the possibility of being cut at all. More importantly, it should be realized that while Winchester has stopped civilian production of Black Talon, there is quite a supply of this ammunition in private hands stemming from a mass buying frenzy at the announcement by Winchester. As a result of its popularity, it is reasonable to suspect this ammunition may be encountered in shootings in the near future.

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### References

- [1] Mellen, P., Wright, D. G., and Smialek, J. E., "Black Talon Bullet," *American Journal of Forensic Medicine and Pathology*, Vol. 14, No. 3, Sept. 1993, pp. 270-271.
- [2] Quebbeman, E. J. and Hargarten, S. H., "Black Talon: A New Risk for Percutaneous Injury," *Journal of Trauma*, Vol. 35, No. 3, Sept. 1993, p. 489.
- [3] Petty, C. E., "Black Talon: Designed for Defense," *American Rifleman*, Vol. 140, No. 11, Nov. 1992, pp. 36-39, 80-82.

### Commentary on "Proficiency of Professional Document Examiners in Writer Identification" (J. Forensic Sci., Vol. 39 No. 1, Jan 1994, pp. 5-14)

Dear Sir:

The above-referenced paper concludes that "the hypothesis that professionals and nonprofessionals are equally proficient in writer identification was found in our test to have probability of less than 0.001." It speaks of "the alternative hypothesis" being that "there exists a significant difference." Such statements are not acceptable descriptions of statistical hypotheses or tests; the existence of a "significant difference" is not a statement about a hypothesis, but a characterization of the data. A *P* value like 0.001 pertains to the data given that the null hypothesis is true. Since it is computed only by assuming the truth of the hypothesis, it cannot be interpreted as the chance that the hypothesis is true.

Nevertheless, it seems clear from the information reported that the professionals beat the nonprofessionals to an extent that would occur very rarely if the seven FBI examiners and the ten graduate students were equally adept and motivated. Generalizing from this finding, however, is not easy. The authors do not reveal what each group of subjects was told and what each may have surmised about the purpose of the study. The authors give no objective evidence that the students were as motivated as the FBI examiners, but rely on their "impression" that all the subjects "performed at the peak of their abilities." The resemblance of the task of classifying 86 documents in 20 handwritings to the typical forensic case is not discussed.

For such reasons, the authors are correct in describing the study as "a modest step" in filling "a lamentable lack of empirical evidence." They are to be commended for taking this step. Further work that might confirm these initial findings would be of considerable interest to the legal community.

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TABLE 1—FBI ammunition test results for Winchester Black Talon 230-g .45 ACP Centimeters of penetration/bullet diameter expansion in centimeters in 10% ordinance gelatin behind various test barriers at measured distances. (From Petty, 1992).

	No Barrier 10 feet	Heavy Cloth 10 feet	Steel 10 feet	Wallboard 10 feet	Plywood 10 feet	Auto Glass 10 feet	Heavy Cloth 20 yards	Auto Glass 20 yards
Shot No. 1	29.85/1.92	32.39/1.99	44.45/1.36	40.64/1.66	37.47/1.89	27.94/1.40	33.02/1.94	35.56/1.45
Shot No. 2	30.48/2.00	35.56/1.92	41.91/1.35	58.42/1.13	72.39/1.13	26.04/1.64	31.75/1.96	27.94/1.41
Shot No. 3	31.12/1.95	34.29/1.89	45.09/1.37	46.99/1.37	39.37/1.68	23.50/1.48	32.39/1.51	33.65/1.45
Shot No. 4	29.21/1.94	41.91/1.69	43.18/1.35	43.81/1.76	39.37/1.92	27.94/1.35	36.83/1.94	26.04/1.42
Shot No. 5	31.12/1.95	33.02/1.95	43.18/1.32	48.26/1.36	38.11/1.84	26.67/1.48	34.93/1.99	34.29/1.41
Average	30.25/1.95	35.43/1.89	43.56/1.35	47.63/1.46	45.34/1.70	26.41/1.47	33.78/1.96	31.50/1.42

**Author's Response:**

Dear Sir:

Our letter is in response to Professor Kaye's comments on our paper "Proficiency of Professional Document Examiners in Writer Identification." We thank Professor Kaye for his interest in our work and welcome the opportunity to address his thoughtful comments.

Professor Kaye agrees with us that the data reported in our paper show significant difference between the professional and non-professional groups that were tested. He is right in correcting our statements on p. 6 and p. 13. We said: "the hypothesis that professionals and non-professionals are equally proficient in writer identification was found in our test to have probability of less than 0.001." Strictly speaking, we should have said: "the probability of obtaining our data, given that professionals and non-professionals are equally proficient in writer identification, is less than 0.001." We thank Professor Kaye for this important correction. Even with the correction, however, (quoting Kaye) "it seems clear from the information reported that the professionals beat the non-professionals to an extent that would occur very rarely if the seven FBI examiners and the ten graduate students were equally adept and motivated." This indeed is the primary message of our paper.

Professor Kaye wonders "what each group of subjects was told." Both groups were told that we are collecting data in order to examine the differences between professionals and non-professionals in writer identification.

Professor Kaye wishes that we discussed "the resemblance of the task of classifying 86 documents in 20 handwritings to the typical forensic case." We have selected this task on the basis of extensive interviews with FBI document examiners. They have described the comparison and association of questioned documents with each other as one of their major tasks. We have therefore designed a test that asks for comparison and association of questioned documents with each other. We selected the document numbers (86/20) so that in our estimate the work could be completed in one to two work days.

The rest of Professor Kaye's comments we find somewhat less significant. "Objective evidence that the students were as motivated as the FBI examiners" would be nice to have. It is always good to examine the psychological state-of-mind of the tested subjects. Yet, such evidence is extremely hard to come by. Moreover, one wonders whether it could be reliably obtained without affecting the performance of the subjects during the test. We could offer only our impressions and stated so explicitly.

Indeed, all empirical work that tries to establish existence of expertise is subject to objections of one kind or another. All tests could be made in one respect or another more comprehensive, more objective, more typical, etc. Researchers in the area of handwriting identification continue to lament the lack of empirical evidence—we have tried to supply some. All our raw data is available, and it can be subjected to any method of analysis favored by other students of the topic.

We hope that Professor Kaye and others will further the empirical investigation in this field, and that future discourse will continue to center on new evidence.

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