SUMMARY OF THE MAIN FINDINGS AND CONCLUSIONS OF THE CONFERENCE "INGESTION OF SPENT LEAD AMMUNITION: IMPLICATIONS FOR WILDLIFE AND HUMANS"

IAN NEWTON

Centre for Ecology and Hydrology, Monks Wood, Abbots Ripton, Huntington PE28 2LS, England. E-mail: ine@ceh.ac.uk

Transcribed from Conference Expert Panel 15 May 2008.

NEWTON, I. 2009. Summary of the main findings and conclusions of the conference "Ingestion of spent lead ammunition: Implications for wildlife and humans." *In* R. T. Watson, M. Fuller, M. Pokras, and W. G. Hunt (Eds.). Ingestion of Lead from Spent Ammunition: Implications for Wildlife and Humans. The Peregrine Fund, Boise, Idaho, USA. DOI 10.4080/ilsa.2009.0321

Key words: Ammunition, bullet, food, game, humans, hunting, lead, lead poisoning, policy, regulation, shot, wildlife.

I WOULD LIKE TO THANK our expert panel for their helpful comments, and would now like to make a few general points arising from the conference, on which we might hang part of our discussion.

First, the science: what have we learnt?

1. Many problems of lead in people and wildlife have been long recognized, and some have been addressed. The banning of the use of lead in ammunition over wetlands has greatly reduced the huge mortalities in waterfowl and others which were formerly so apparent. We can assume that this measure has reduced lead consumption by people, and also by some scavengers such as Bald Eagles. However, other uses of lead in ammunition have continued unabated, as a result of which incidental mortalities in many birds and mammals are still staggeringly and unnecessarily high.

2. A second finding concerns the behavior of bullets: the way that lead from lead-based bullets scatters on impact, distributing fragments widely within carcasses, and making it impossible for people or scavenging animals to avoid ingesting lead along with meat. No normal butchery can remove it, so if you eat lead-killed meat, inevitably you eat lead. While this fact may have been known to some for years, new studies have re-emphasized it in a most dramatic way. This is clearly a problem of huge geographical extent, potentially affecting large numbers of people in North America and elsewhere, especially hunters and their families.

3. Lead has been shown to affect adults and children at far lower concentrations in body tissues than formerly thought, and at lower concentrations than current regulations acknowledge. Lead obtained from wild meat shot with lead-based ammunition has been linked with elevated blood lead levels in people.

4. It follows from these findings that we have on our hands a bigger human health problem caused by lead from ammunition than previously recognized, potentially affecting people over most of the continent, but particularly in the many areas where wild game forms a significant part of the human diet.

5. Lead is also causing huge incidental mortality in wildlife. Some species ingest spent gunshot along with grit, while others ingest lead fragments from the carcasses and gut piles of shot animals on which they feed. More than 130 species are regularly affected in this way, and in some species thousands or tens of thousands of individuals die from lead ingestion every year in North America. For most of them, we have no assessment of the effect of this lead-caused mortality on population levels. However, it is clear that in current conditions one species, the California Condor, can no longer maintain a self-sustaining population in its historic range: the mortality from lead-based ammunition obtained from game carcasses and gut-piles well exceeds its natural reproductive rate. While ever lead-based bullets of current design are used as now in game hunting, the condor is unlikely to survive anywhere in North America. It is being kept from extinction in the wild only by a program of intensive conservation management-cum-veterinary care, involving frequent capture and chelation therapy to reduce the blood levels of individuals. This spectacular and charismatic species is one of the largest flying birds in the world, which has inhabited North America for millions of years, long before humans evolved and arrived on the continent. What a pity if it disappeared, lost to all future generations from a problem that could so easily be solved, with benefits for all.

So what needs to be done?

6. On many aspects more research is desirable. We can always benefit from more targeted research. Some specific gaps in knowledge have been identified, and will need to be filled, apart from continually updating our information base. Everyone loves 'recent information,' even though much of it may tell those of us in the field no more than we already know. A major requirement is for a study of the blood levels and impacts of lead in hunters and their families, especially those living in the lower States, outside the northern and native communities already known to be affected. But I believe firmly that we already have sufficient scientifically-robust information to go public with some of the new findings. Indeed, some would argue that it may be irresponsible not to make our findings more widely known, especially those concerning the distribution of lead fragments in meat. We need to spread our information as widely and assiduously as possible.

7. Some of us came to this meeting as wildlife biologists, others from the medical/public health arenas. But if something is to be done quickly about the problems we have discussed here, I believe – as others have already stated – that we will have to act primarily on the basis of human health rather than on wildlife impacts. Some hunters are unaware or unconcerned about secondary poisoning of non-target animals, but they do care about their own health and their own families.

8. Those sectors of society most in need of this new information are the hunters themselves, along with other consumers of lead bullet-killed and lead shot-killed meat. It is to these people that I believe our efforts at disseminating information should be directed with greatest urgency. Public health departments and community food centres could also respond responsibly to new scientific findings. Some public authorities are already working on reducing lead contamination from other sources. There may be no need for advocacy here: just the targeted distribution of unequivocal scientific findings by appropriate messengers.

9. During the course of this conference, two approaches for reducing the use of lead ammunition (in favor of less toxic kinds) have been suggested. One is the 'top down' mandatory approach, in which case the job would be to convince the authorities (state or federal) to introduce appropriate legislation or regulation. This process would inevitably take time, may not be considered as a priority by the authority, and in the end may be unsuccessful. And even if legislation were introduced, the twin problems of compliance and enforcement would remain (never easy in the hunting community). This approach could also be seen as confrontational, perhaps bringing resentment and other undesirable consequences. Nevertheless this approach is currently on trial in condor range in California and, with a different hunting culture, in Hokkaido, Japan.

Legislation was previously used successfully in the banning of DDT and other organo-chlorine pesticides. However, in that case the public were well

prepared beforehand, following (among other things) the publication of Rachel Carson's book *Silent Spring*, which produced a ground-swell of public opinion in support of a ban, despite vigorous and dirty attempts by the agrochemical industry to quash it. Similarly with smoking, the public were prepared beforehand before any attempt was made to curb the excesses of the tobacco industry. With lead ammunition, we do not yet have the benefit of an educated and supportive public.

The second approach is 'bottom up,' through which hunters are informed of the human health problems, and are asked for help on the wildlife issues, in the hope that they appreciate the advantages of switching to non-toxic ammunition, and voluntarily change their own behavior. This method seems to have worked with measurable success, at least in the short term, in Arizona, as well as in Germany where hunters are switching to non-lead ammunition to ensure that their saleable product is considered fit for human consumption. However, to solve the wildlife problems, high compliance would be crucial. I can imagine that hunters would change ammunition when hunting to feed themselves and their families, but may be less inclined to do so merely for recreational varmint hunting.

Neither approach (top down or bottom up) is ideal, but nor are they mutually exclusive. My own view is that we need both, beginning now with the bottom up contact with hunters and the wider public, and in the process paving the way for possible legislation at some later date. Whatever approaches are taken, we can expect that obstacles outside our control will get in the way: the availability of non-toxic ammunition, the price of non-toxic metal, negative and ill-informed press comment, including attempts to portray an anti-lead argument as an anti-hunting argument. At the moment we lack any formal system for rapidly countering the ill-informed criticism and opposition that will surely arise in any publicized attempt to replace lead by less toxic alternatives. None of this should deter us from making a start: we have the pioneering experience from Alaska, Arizona, and North Dakota as encouragement.

Biography.—**Professor Ian Newton, D. Phil., D.Sc., FRS, OBE,** Senior Ornithologist (Ret.) Natural Environment Research Council, UK, Chairman of the Board, The Peregrine Fund, Chairman of the Council, the Royal Society for Protection of Birds in the United Kingdom. Ian received his D.Phil. and D.Sc. degrees from Oxford University. He has studied a wide range of bird species, but may be best known for his work on raptors, and his landmark book *Population Ecology of Raptors* first published in 1979. His 27-year study of a Sparrowhawk population nesting in southern Scotland resulted in what many consider to be the most detailed and longest-running study of any population of birds of prey. He is author of more than 300 papers and several books, including *The Sparrowhawk* (1986), *Population Limitation in Birds* (1998), *The Speciation and Biogeography of Birds* (2003), and *The Ecology of Bird Migration* (2007).