

INTRODUCTION

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WE ARE HERE FOR THE NEXT THREE DAYS to discuss findings on the impacts of lead exposure on people and wildlife. Many of the findings that will be presented here are new – the result of research over the last couple of years. To my knowledge, this is the first time that medics and wildlife biologists have been brought together in this way to share their knowledge, and hopefully come up with recommendations on what needs to be done: not only in future research, but in influencing societal views and government policy regarding the use of lead.

For much of my scientific career, I have worked on the impacts of pesticides and pollutants on wildlife. So the kinds of problems to be discussed at our conference are not entirely new to me—although I must say that I have been involved only very marginally with lead, and can claim no particular expertise in this field.

Lead is such a useful metal to us in so many different ways. It is not surprising it has a long history of use by human societies around the world, extending back for more than 3,000 years. To say that many of these uses have created serious health problems is an under-statement, and some of lead's effects on people are now well known. Depending on exposure, the effects range from relatively mild depression and lethargy, through to seizures, blind-

ness, mental impairment and even death. These findings have led in the last 150 years to many of the uses of lead being outlawed in the interests of human health. The banning of its use in many paints and gasoline has occurred within our own recent lifetimes.

Most of these health problems result from the body mistaking lead for calcium and other essential metals, and thus incorporating lead into nervous and other vital tissues. Blood levels in adult people of only 1 ppm have been linked with many debilitating symptoms, and recent research has suggested that blood levels averaging as low as 0.1 ppm in children can be associated with measurable mental impairment. Clearly, the effects of low level lead exposure in humans are not trivial.

And nor are they in wildlife. For in birds and mammals, we are concerned not merely with the effects on individuals, but also on populations. Through the mortality it can impart, lead can be a key factor limiting population sizes and causing serious numerical declines. At least two major effects have been described. One involves mainly seed-eating birds, which deliberately ingest grit to assist in the digestion of seeds and other plant material. Some such species, from doves to swans, also ingest spent shotgun pellets along with grit, and in

consequence have suffered huge mortalities. In many countries, the use of lead shot over wetlands has now been banned, but its use in the wider environment still persists.

The second major impact occurs in meat-eating animals, including humans, condors and eagles, which ingest lead bullet fragments and pellets from the carcasses of shot game animals. This is a problem that we are only now getting to grips with, and on which urgent action is required. This source of lead could be affecting people on a geographical scale and to a degree not previously appreciated. Fortunately, alternatives to lead ammunition exist, if only the will or the legal pressure was there to take them up.

The aim of this conference is to bring together experts from the medical and wildlife fields to pull together some of this information, and discuss ways of addressing the problem. It is becoming increasingly clear that we have on our hands a major environmental problem, but one which could in theory easily be solved, if only the will was there.

Perhaps at this early stage I could acknowledge the efforts of my colleagues in The Peregrine Fund and other members of the organizing committee in getting this conference off the ground. Their preparatory work has been exemplary and professional.

The rest of today will provide us with background information on lead and its uptake by people and animals. In particular, we will hear from Dr. Michael Kosnett about the damaging effects of very low levels of lead on children. We will also hear about society's response in different countries to the harmful effects of lead by means of both voluntary and legislative procedures.

Tomorrow is concerned mainly with studies of wildlife exposure to spent ammunition, and much new research will be presented, especially on problems resulting from game hunting. The third day is concerned with remediation of the problem from ammunition sources, and will include some interesting results on game consumption by people from Alaska. We end the conference in the afternoon with an expert panel session that will help identify gaps in our knowledge, and hopefully make recommendations for solutions to the problem.

I hope you all enjoy the conference, and your time in Boise.

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, Royal Society for the 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).