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James Herriot—the popular vet from the television series *All Creatures Great and Small*

genome sequences between dogs, horses, cats, and humans is well advanced,^{6,7} with progress also in pigs, cattle, and sheep. Dogs combine exceptional phenotypic diversity, exemplified by breed differences in size and lifespan, with a relatively uniform genotype. Among some 370 canine genetic disorders, about half have exact human analogues.⁸ They generally resemble the human disease more closely than do rodent models, reflecting closer evolutionary kinship and DNA sequence identity.⁹ The National Human Genome Research Institute regards the canine genome as a key research priority. Molecular genetics adds new dimensions to comparative studies—identification of novel disease genes, new disease models, new molecular targets for drugs, evaluation of gene therapy, and elucidation of genotypic variation in therapeutic responses.

Comparative medicine emerged from the realisation that humans and animals shared similar cellular structures and mechanisms and faced challenges from similar microorganisms. But disease models were just that; resemblances between diseases. Now molecular science can show identical receptors, mediators, and

genes. This should not surprise us, unless we are creationists; we share a rich evolutionary legacy of genes, many involved in diseases. Comparative medicine is no longer the study of mere similarities but of the same disease in different species. We need parallel development of comparative clinical studies and research in molecular genetics. The Comparative Clinical Science Panel should provide the necessary strategic coherence to yield knowledge and reduce suffering, unfettered by species.¹⁰ In 1988 Stewart Cameron wrote: “Too little attention has been paid to comparison of human and spontaneous animal disease, either by veterinarians or physicians, and it is to be hoped that greater exchange of information can be organised in future.”¹¹ With the development of the Comparative Clinical Science Panel, this hope may now be fulfilled.

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Human health and nature conservation

Ecotherapy could be beneficial, but we need more robust evidence

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We call animals in their natural habitat wild, implying danger. Research that focuses on risk can foster a fearful attitude towards nature, disabling society's capacity for choice.¹ These fearful views from contemporary anthropology contrast sharply with the biological, evolutionary, and ecological view of the influential American zoologist Edward Wilson. Wilson coined the concept of biophilia: “The connection that human beings subconsciously seek and need with the rest of life.”² This view, emphasising connection with nature, builds on behavioural observations by Konrad Lorenz, a Nobel prize winner for medicine.³

The therapeutic implication of biophilia is ecotherapy: restoring health through contact with nature.⁴ British author Gregory Bateson's theoretical framework for improving health through conserving nature incorporated a “sense of unity of biosphere and humanity” that engenders connection, restoration, and respect for self and planet.⁵

The Society for Companion Animal Studies promotes pets for health, a topic discussed by McNicholas and colleagues in this issue.⁶ But extra benefits may come from the naturalness factor arising from connection with wildlife. Use of wildlife in some therapies is reported to improve quality of life.⁷ Smaller

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Smaller animals such as owls have been used in therapies for children

animals (for example, squirrels, owls, and raccoons) have been used successfully in therapies for children with emotional and behavioural problems.⁸

Most therapies involve participation in conservation projects. Some projects focus on large species in challenging environments, such as nature therapist Ronen Berger's work with endangered wolves and birds of prey in the Israeli wilderness⁹ and Antonioli and Reveley's use of dolphins in the Caribbean.¹⁰ Projects in the United Kingdom, such as the Essex *Growing Together* community initiative, conserve species varying from badgers to rare moths. Many projects address mental health needs and usually involve small groups of patients under supervision.¹¹ Wildlife gardens can flourish in small spaces close to human habitation, like Addenbrooke's Hospital's Jubilee garden developed by a stroke patient during rehabilitation.

People who take part in conservation projects report subjective health benefits, ascribed to being outdoors and to feeling part of a greater system connecting beyond the individual. Such projects can help overcome social isolation among people with disabilities through embracement,¹² develop skills, and improve employment prospects as well as provide the known benefits associated with exercise. One volunteer in the *Meanwhile Wildlife Garden* project, run by the mental health charity *Mind* to conserve a small wildlife habitat in inner London, described his experience: "Initially it was something that I would do as I recovered from my illness, but now it has become the main focus of my energies."¹³ Conservation led him to a recognised qualification and paid employment in urban gardening.

In our observations of ecotherapy projects we have noted few risks to health, and any injuries have been minor—for example, a superficial animal bite. Indeed, established projects were excellent examples of risk management for potential hazards (such as those related to equipment or terrain).

Although initial scoping research has been promising, the UK needs robust evidence such as health

impact assessments of wildlife projects to determine their objective therapeutic value. Public health, clinical, and educational services need to act to provide this evidence, allowing research and practice to grow together. English Nature has advocated a national strategy to encourage people to reconnect with nature and benefit from proximity to wildlife.¹⁴ Partnerships between healthcare providers and nature organisations to share and exchange expertise could create new policies that recognise the interdependence between healthy people and healthy ecosystems.

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