

**Professor Osoryn Shagdarsuren  
(1929-2010)**



Professor Osoryn Shagdarsuren, an outstanding scientist and educator of Mongolia, passed away on February 3, 2010, at the age of 81, after an acute illness. O. Shagdarsuren was born in 1929 in Dund Khavtsal area of the Matadkhan Mountain in the Matad Soum of Dornod Aimag, in the family of a herdsman.

Having completed the school course, he went to Ulaanbaatar, the capital city of Mongolia to be enrolled at the university. Being a first-year student, Shagdarsuren became interested in unique fauna of Mongolia, especially birds of prey. O. Shagdarsuren graduated from the National University of Mongolia in 1955 majoring in pedagogy of chemistry and biology. His academic performance was so good that he was appointed as a lecturer at the university upon his graduation. At about the same time, he started his research on Mongolian raptors and he was accepted into a graduate study at the Moscow State University in 1961. There he finished his candidate's (Ph.D) dissertation titled "*Raptors of Central and Southern Regions of Mongolia and Their Practical Importance*" under the supervision of Professor G. P. Dementev. This made him the first ornithologist of Mongolia with a doctorate degree. Since that time, his

research interest has evolved into studying game animals, wildlife ecology, the biology and ecology of pastoral livestock in Mongolia. As a result of his research on game animals and their management in Mongolia, he finished his Doctor of Science degree in 1974 at the Moscow State University. During the last decades of his career, his research interest was mainly on traditional pastoral animal husbandry and the biology and ecology of Mongolian breeds of livestock.

Dr. Shagdarsuren served as the director of the Institute of Biology (formerly the Institute of Natural Sciences) of the Mongolian Academy of Sciences from 1964 to 1982, the scientific secretary of the Mongolian Academy of Sciences in from 1982 to 1983, and the president of the National University of Mongolia from 1983 to 1989. He became the Fellow of the Mongolian Academy of Sciences in 1982. In 1997, the president of Mongolia awarded him with the title of Honorary Teacher of Mongolia. In 2002 he won the Government Award of Mongolia for his achievements and advancement in science.

His long and distinguished academic career helped develop biological thinking in Mongolia. It is hard to imagine what the science and education of biology would have been without Professor O. Shagdarsuren. Not just biology, the modern science as a whole has been practiced in Mongolia only for a few decades and a few distinguished pioneers have shaped the landscape of modern science in Mongolia. From those figures, Prof. Shagdarsuren was a major representative forging and witnessing the history of modern biology in Mongolia for decades. He was not only a figure in academic circles, but he was a statesman, science writer and essayist. His accomplishments are numerous and manifold and his results are documented in his scientific publications. He published several books on theoretical aspects of biology, ecology of mammals and birds, biology of livestock and pastoral animal husbandry, more than 200 articles, attended scientific conferences and gave seminars (e.g., Shagdarsuren, 1966, 1969a, b, c, 1970, 1971a, 1971b, 1980, 2004, 2005, 2007). We will not recount in detail what he has

accomplished. Rather, we would like to recall certain things that we had first-hand experience with.

Professor Shagdarsuren was one of the first evolutionists in this country. He wrote the foreword of the Mongolian translation of "*Origin of Species*" and taught the first evolution course at the university. His thinking was comprehensive, and his reasoning always went after the ultimate causes of biological phenomena. In his studies on the biology of Mongolian livestock breeds, he argued that these animals were very different from highly productive specialized breeds and that these differences can be accounted for generations of selection performed upon the animals. However, he suggested that Mongolian livestock breeds are selected for many traits that confer better overall fitness as the harsh natural conditions of Mongolia would eliminate those animals that are unequally selected for certain traits. In contrast, highly productive breeds are strongly selected for certain special traits such as the milk, meat, fur, cashmere and other productivities. Trade-off between traits was clearly recognized by him, although he never referred to this as such. Therefore, his thinking was always evolutionary.

In one of our early discussions about microevolution, he suggested that some traits were flexible when exposed under different environmental conditions, therefore blocking the effects of selection on genetic make-up. In other words, the same genetic make-up can confer for different phenotypes under different conditions, probably by the expression by different genes. After many years, we learned that these effects are nowadays known as *phenotypic plasticity* or a *norm of reaction* in case of continuous functional interrelationship of a range of environments to a range of phenotypes. It is impressive as we know for fact he arrived at this conclusion purely by logical reasoning, not by having read about it.

Sometimes, his thinking was quite unorthodox as to suggest that diatoms must somehow carry out nuclear reaction to produce their silicon cases. We believe that it is such kind of thinking that enabled him to be of different and appealing personality.

He was interviewed by a popular science magazine "*Shinjleh Uhaan, Amidral*" ("*Science and Life*") in early 1990's. He suggested that

theoretical thinking in science in general was "in famine" in Mongolia to use his exact terms. He reasoned that Mongolian scientists complain about the lack of scientific equipment and that was besides the problem at hand. If expensive scientific equipment were bought, most scientists in Mongolia did not know what to do, he argued. Instead, scientists should learn more about fundamental concepts of their field, raise questions, and develop hypotheses. If there were no ideas to test, what do we need equipment for? We believe that his argument is still in Mongolia valid after 20 years. Years later, one of us actually addressed some of these issues in a joint paper with him using the ISI database, which was published in the pages of this journal in 2004.

At the end of his long and distinguished career, Shaagaa bagsh (as we called him in short) has turned into a caring and supportive person. After the Soviet system collapsed, he understood the importance of English. At that time, we did not have much access to scientific literature in English. English books and papers were a rarity. After lecturing and encouraging about the importance of learning not only to speak English, but also to write fluently in the language, he gave a biology textbook in English to one of us (an old one called *Biology for Nurses* by Karuzina, published in 1969, nevertheless proved to be useful). It was this kind of gesture that made him intensely respected individual, considering how high-flier he was.

He was a man of remarkable optimism and a special taste for life. After his retirement he never stopped working, and until the end of his life he worked as a professor emeritus at the Department of Zoology, National University of Mongolia. All his pupils, friends and colleagues regarded O. Shagdarsuren as a distinguished biologist, a gifted research leader, and an amiable personality. We would like to think that we are proud to have known Professor Shagdarsuren.

Prof. O. Shagdarsuren will be fondly remembered by his students and colleagues as a distinguished scientist and an honored teacher who contributed much to the development of science and education in Mongolia.

#### Selected Bibliography

Shagdarsuren, O. 1966. Biological aspects of the

- thermal metabolism of livestock. *Mongolian Journal of Agriculture*, 3: 5-16. (in Mongolian)
- Shagdarsuren, O. 1969a. Artificial selection and some aspects of breeding biology. *Science and Life*, 1: 41-49. (in Mongolian)
- Shagdarsuren, O. 1969b. Artificial selection and some problems of the animal husbandry. *Science and Life*, 2: 50-56. (in Mongolian)
- Shagdarsuren, O. 1969c. Traditional methods of the animal selection by Mongols. *Mongolian Journal of Agriculture*, 1: 117-127. (in Mongolian)
- Shagdarsuren, O. 1970. An astronomical year and its biological significance. *Proceedings of the Institute of Biology, Mongolian Academy of Sciences*, 5: 178-188. (in Mongolian)
- Shagdarsuren, O. 1971a. Natural Selection and Pastoral Animals Husbandry. Ulaanbaatar, State Press. 60 pp. (in Mongolian)
- Shagdarsuren, O. 1971b. Some important aspects for the estimation of the biomasses in Mongolia. *Proceedings of the Institute of Biology, Mongolian Academy of Sciences*, 6: 104-114. (in Mongolian)
- Shagdarsuren, O. 1980. *Pastoral Animal Husbandry and Some Aspects of Theoretical Biology*. Ulaanbaatar, State Press. 158 pp. (in Mongolian)
- Shagdarsuren, O. 2004. *Fundamentals of Ecology*. Ulaanbaatar, National University of Mongolia Press, 176 pp. (in Mongolian)
- Shagdarsuren, O. 2005. *Biology of Mongolian Pastoral Livestock and Characteristics of Nomadic Animal Husbandry*. Ulaanbaatar, National University of Mongolia Press, 304 pp. (in Mongolian)
- Shagdarsuren, O. 2007. *Some Research Results on the Experiences of Pastoral Animal Husbandry Organization by Nomads*. Ulaanbaatar, National University of Mongolia Press, 40 pp. (in Mongolian)

**Badamdorj Bayartogtokh**

*Department of Zoology,  
National University of Mongolia*

**Bazartseren Boldgiv**

*Department of Ecology,  
National University of Mongolia*