

Helge Johnsson, 25 Years Co-Editor of *Silvae Genetica*



AS HELGE JOHNSSON resigns from his official post and retires as co-editor of *Silvae Genetica* it is timely to salute a pioneer of forest tree breeding and a great name in applied forest genetics.

HELGE JOHNSSON has always been concerned with plants. His father owned a market garden in south Sweden and it is probable that the eldest son was meant eventually to take over the enterprise. His ambition, however, was to carry him much further. A clear head and talent for writing enabled him to pass his "studentexamen" in 1933 — his studies at the gymnasium began rather late and were completed in record time. Three years later he passed the filosofie kandidat examination and five years later his filosofie licentiat examination, an achievement deserving respect because from 1937 he had also been working for his living and, like many other young men, had been called to military service from 1939 to 1941. The cold star of scantiness shone on him during this period. In 1944 he defended his doctor's thesis on a species of the grass genus *Alopecurus*.

During the thirties HELGE JOHNSSON held two posts of short duration and one of these was at the famous plant breeding institute at Svalöv, where his energy and purpose soon attracted attention.

On 3 June 1935 HERMAN NILSSON-EHLE discovered the giant aspen, shown by ARNE MÜNTZING to be triploid, and this proved a trump card in awakening interest in forest tree breeding. The new tree breeding institute acquired as first director NILS SYLVÉN (1880—1969), a great authority on polymorphism in forest trees and the breeding of forage plants and on 1 April 1938 HELGE JOHNSSON joined the staff of the Association for Forest Tree Breeding at the main station at Ekebo near Svalöv. SYLVÉN mainly concerned himself

with directing the organisation and with public relations while JOHNSSON conducted the practical work of grafting, controlled crossing, sowing and planting.

At first only broadleaved trees were studied, and polyploidy breeding took priority, especially for aspen and birch. In 1942, however, a national breeding programme for conifers began, the staff was increased and new experimental stations established. Of great importance to the breeding of aspen were the annual grants from the Swedish Match Company and the fact that the Association had a worker like JOHNSSON. It has also been of great value to Swedish forest tree breeding — and himself — that HELGE JOHNSSON was able to work continuously from 1938 till 1977 at the same place. His scientific output has unusual continuity and concentration on long-term problems. The first of his eight publications on *Populus*, "Cytological studies of diploid and triploid *Populus tremula* and of crosses between them", appeared in 1940 and his latest, "Das Produktionspotential der Hybridaspes (*Populus tremula* × *tremuloides*)" in 1976. The first of his twelve publications on *Betula*, "Breeding of birch — goals and methods", appeared in 1939 and his latest, "South and north transfer of birch provenances", in 1976. Until recently birch *Betula verrucosa* and *B. pubescens* were the third most important plantation subject. Now *Pinus contorta*, introduced from north America, occupies third place,

HELGE JOHNSSON's publications on aspen and birch in the forties were the first to deal with the prospects for increased forest production by polyploidy and species crosses and by a synthesis of both these routes. They attracted great attention, brought their author international fame and qualified him for the Chairs of Forest Botany (in 1946) and Forest Genetics (in 1947) in Stockholm.

NILS SYLVÉN retired at the end of 1949 and HELGE JOHNSSON succeeded him as Director. He took charge of the breeding of Scots pine for south Sweden to make himself better acquainted with one of the two most important trees of Sweden. *Pari passu* with a cooling of interest in broadleaved trees JOHNSSON gave most time to Scots pine. During the years 1953—1976 he published 18 papers on different aspects of breeding Scots pine, flowering and seed production in grafts and seedlings, progeny tests after controlled and open pollination, provenance tests, seed orchards, disease resistance and quality problems. JOHNSSON also found time to produce many general surveys, annual reports and lectures. He was one of the panel of authors of the handbook "Breeding in Sweden" (1951) and his contribution remains useful today. In the "Handbuch der Pflanzenzüchtung" of 1962 JOHNSSON was responsible, with ÅKE LJUNGER, for the sections on *Betula*, *Alnus*, *Fagus*, *Quercus*, *Fraxinus* and other species. An important work from 1951 is "Avkommeprövning i skogsbrukets tjänst", in which HELGE JOHNSSON, in co-operation with ENAR ANDERSSON and ÅKE GUSTAFSSON, set down procedures for testing the clones included in the first generation of seed orchards.

The original organisation of forest tree breeding in Sweden was strongly influenced by south Swedish scientists, industrialists and private people. Although north Swedish enterprises gave much support it was natural in the thirties for the centre of forest tree breeding to be located near Svalöv and the University of Lund. However, because of the great differences in day length and temperature it

became essential that tree breeding for northern Sweden should be done within that region and because the forest industries of northern Sweden were able to give more money for forest tree breeding, it was decided in 1959 to transfer the headquarters of the Association to Uppsala. HELGE JOHNSON was appointed Director of the southern district and Chief Scientist of the whole organisation. With further reorganisation in 1967, fertilizing was added to the programme and the name was changed to „Institute for Forest Tree Improvement“. The reorganisation benefited HELGE JOHNSON because a special grant made possible his attachment as Scientific Lecturer and Tutor to the Genetics Institute of the University of Lund and allowed him to continue working at Ekebo. He was also granted the title and position of Professor by the Swedish Government.

In reviewing the scientific achievements of HELGE JOHNSON one is struck by his comprehensive attack on major problems. There were no well worn tracks to follow and he was fortunate to begin with two most rewarding subjects, aspen and birch, which are easy to graft, have profuse pollen and seed production, speedy seed ripening on newly made grafts and rapid juvenile growth. JOHNSON was able to exploit all these advantages and his papers are pioneer works which will continue to be studied in the future. He laid the foundation for further progress and refuted the old idea that hybrids between *Betula verrucosa* and *B. pubescens* are quite common. He demonstrated that a hybrid *B. verrucosa* × *japonica* could produce a yield of timber surpassing by 35% that of the best of the parent species. In 1966, however, he concluded that “birch breeding should be directed towards selection within *Betula verrucosa* with some contribution from hybridisation with more northern provenances so as to obtain improved form and possibly also increased growth”.

Several works concern species hybrids within *Betula* and *Populus* and the possibilities of using in forest practice the effects of heterosis and artificially induced triploidy. The juvenile growth of triploids of *Populus tremula* was considerably greater than the comparable diploids. Even more rapid growth was displayed by diploid and triploid *Populus tremula* × *tremuloides*, which, according to JOHNSON'S calculations, have an optimum rotation of 35 years against 60 in *Populus tremula*. The yield in value should be 3 to 4 times higher, and the economic result should surpass all other Swedish forest yield. Later papers deal with resistance to fungal diseases of hybrid aspen and heterosis in latitudinal hybrids within *P. tremula*.

JOHNSON'S work on Scots pine dealt, as already mentioned, with all aspects of breeding and seed orchards. Among the immediately applicable results was the finding that transfer of provenances in Sweden south of latitude 59° N hardly effects volume production. Further north, however — as was shown in detail by others — where the climatic conditions are so much harder, a satisfactory combination of survival and growth can be obtained only by southerly transfer of about two degrees latitude at constant altitude. JOHNSON has also produced papers on *Picea abies*, *Alnus glutinosa*, *Quercus robur* and *Pinus contorta*.

His long and successful work has brought HELGE JOHNSON to a leading position among the world's forest tree breeders. He has made weighty contributions to cytology, genecology, evolution and physiological genetics. The methods of forest tree breeding have been treated in some 30 papers. JOHNSON has also produced several surveys at the invitation of international organisations — a token of the esteem which he enjoys within and outside Scandinavia. He has been Visit-

ing Lecturer and undertaken many journeys abroad. JOHNSON'S talent for conveying, in speech and writing, complex matters with clarity is much admired. The late KLAUS STERN emphasised HELGE JOHNSON'S critical attitude and pointed to his skills in field work as well as in laboratory work, in mathematical computation and in statistical evaluation.

Having worked alongside HELGE JOHNSON for 30 years I can testify to his great industry and creative imagination. At Ekebo, JOHNSON'S handiwork was seen in many ways — as architect, engineer, carpenter and electrician. He spent innumerable evenings in the photographic laboratory. He constructed simple but ingenious apparatus for pollen collections and seed cleaning. However, when the calculator fell to pieces he had too hard a nut to crack. His nearest colleagues could look to HELGE JOHNSON to shoulder the heaviest burdens and he never refused to lend a hand when needed. It is interesting to observe how attentively today's young scientists of Sweden are listening to this most experienced old timer.

As would be expected HELGE JOHNSON has been sought after in many other connections. He was elected a member of the Royal Swedish Academy of Agriculture and Forestry in 1956 and a corresponding member of the Finnish Forestry Society in 1962. He was executive member of the Co-operation Committee for Forest tree Breeding and Genetics during the years 1949—1971, a delegate to the International Poplar Commission from 1947—1956, President of the Society for the Promotion of Oak-cultivation 1957—1976, Co-editor of *Silvae Genetica* 1953—1977. — A journey during 1947 and 1948 in North America proved of great importance to his work and subsequent co-operation with American colleagues. This was followed by others of shorter duration, the most recent being to his eldest son and family in Alaska. The younger son in Central Africa also received a visit from his father after a hazardous drive by car through the Sahara.

HELGE JOHNSON retired on 31 March 1977. He has bought the Director's house at Ekebo so his address will remain unchanged. We can perhaps expect new products from his pen, but he may consider that his work is done and devote himself to his many other interests. If so, we wish this indefatigable servant of forest research his well-earned leisure. HELGE JOHNSON has performed splendid work in a difficult field whose fruits ripen late. So much sooner the tomatoes will ripen and chrysanthemums flower in the greenhouse which he built next to the wall of his home. Here he can practise his maybe dearest hobby, the growing of plants, undisturbed by hectic spring campaigns and other stressful activities.

C. L. KIELLANDER

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