

PROGRAM NOTES BY MR. HAGIWARA

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1. From Edison's phonograph to the SP (78rpm) record

In December 1877, Thomas Edison succeeded in the first experiment. The original Phonograph employed a 10cm diameter brass cylinder with 1mm grooves. A tin foil was wrapped around it. The sound was collected with a big horn and the vibration was recorded as vertical depth variations on the tin foil.

At about the same time, a French man Charles Cross had submitted a similar idea to the French Science Academy in April, 1877. Unfortunately, Monsieur Cross, lacked the funds to materialize his idea beyond the drawing board and the credit for the invention went to Mr. Edison.

In 1878, Edison established the Edison Speaking Phonograph Company and commercialized his invention. However, despite the efforts on advertisement, the performance of the tin-foil technology was not impressive enough to gain popularity, and thus the great inventor shifted his efforts towards research on light bulbs.

It was Graham Bell who picked up the project and further developed Edison's idea. He made a fortune with his invention of the telephone and established a laboratory dedicated to acoustics in 1880. This laboratory later became the Bell Telephone Laboratories, so famous for research in physical sciences. Graham Bell appointed Chester Bell and Sam Tenta to pursue the modification of Edison's Phonograph. They replaced Edison's cylinder and tin-foil with cardboard coated with wax (wax-cylinder) and employed a DC motor for rotation. This machine was called the Gramophone. The year was 1887.

At this time, Mr. Edison, fearing competition, resumed his work on the improvement of the phonograph and came up with a scheme quite similar to Bell's. This inevitably led to a dispute over the patent, which a business entrepreneur Jessie Cot resolved with money. He established the North American Phonograph Company, which later became Columbia, and competed with Victor.

Then Edison's record also became ready for commercialization with the wax-tube replication technology. A machine operating with a spring mechanism was announced in 1894.

◇ *Here, we will show you a wax-record from this era.*

The next important technical development owes to Emile Berlina, an immigrant from Germany. He was a telephone and telegraph engineer who had already invented the microphone. His new idea was to use a disk instead of a cylinder, and also to

employ horizontal vibration instead of vertical vibration for cutting the sound grooves. He started selling his machine with a hand driven turntable and hard-rubber record in Germany, earlier than Edison did, and made substantial profits in 3 years. In 1894, he established the U.S. Gramophone Company in Washington. In the next year he commercialized the 17cm diameter record, which played for 2 minutes, together with the player machine for it. The 1895 version of this machine became the trademark of Victor. A picture by Francis Barrow His Master's Voice (HMV) depicted a dog listening to his deceased master's voice coming from a Gramophone horn. This trademark now belongs to British EMI. Victor Japan also uses it.

◇ *We will show you this machine.*

The U.S. Gramophone Company expanded their business to Britain in 1898. They sold high performance machines from 1901, under the brand name G&T (Gramophone and Typewriter). Within just a few years, recordings were made by the greatest musicians of the era, such as the bass singer Feodor Chaliapin, tenor singer Enrico Caruso and the Czech violinist Jan Kubelik.

◇ *We will now listen to the recordings of Caruso and Kubelik.*

Edison's cylinder method and Berlina's disk method remained in competition for some years. In the end the disk prevailed and Edison also produced it under the name of Diamond Disk in 1912. He kept improving the vertical vibration technology and was reputed to have achieved live-quality sound in 1914. Meanwhile, Geisberg who was responsible for the management of G&T was a musician himself, a decent pianist, and took advantage of his extensive knowledge and contacts to scout the best artists and produce well arranged recording series. On the other hand, Edison was rather indifferent to music and fell behind in software development (in current terminology). By 1929, Edison had withdrawn from the recording industry.

So far, sound recording technology relied only on mechanical methods. The modern electrical recording technology employing a microphone and amplifier derives from the invention of the vacuum tube in 1906. Vacuum tubes were already in use for amplification of electrical signals since 1913 and wider usage came with the initiation of radio broadcast in 1922. It was Maxfield at Bell Laboratory who came up with the idea to use vacuum tubes for sound recording systems. The electrical recording technology was established in 1924 and Bell Laboratory sold the patent rights to U.S. Victor and Columbia.

The electrical recording technology had a very wide dynamic range and picked up the most delicate shades of the sound. The conventional record players with a narrow dynamic range were quite unsatisfactory for reproducing them. Nevertheless an electrical record player with an amplifier and speaker would be extremely expensive and

prone to failures. Therefore, Maxfield's choice was to further improve the conventional record player. He replaced the hard mica diaphragm with a thin (50 micron) and light aluminum alloy (duralumin) diaphragm and achieved the dynamic range from 100 Hz to several thousand Hz. This allowed the reproduction of any musical sound except the lowest bass. The horn was also substantially improved by introducing the impedance matching theory, which led to developing the design that widens exponentially towards the opening. After some hesitation, U.S. Victor bought the patent and introduced the celebrated Credenza machine. In addition to the sound, the combination of an Italian Renaissance style cabinet with a huge 2 meters exponential horn made a strong impression. This record player has continued to fill the atmosphere with the joy of beautiful music, for 77 years since its birth

2. The artists

Marian Anderson (Alto): b.1902, Philadelphia. The first black singer to gain world wide acclaim in the classical repertoire. Excelled in German lieder as well as negro's spirituals. Toscanini praised her deep and rich voice as a once in a hundred years phenomenon.

Beniamino Gigli (Tenor): b.1890, Italy. d.1967, Rome. Educated at St. Cecilia Conservatoire. Sang at the Milano La Scala under the direction of Toscanini. He was recognized as a great singer belonging to the Italian bel-canto tradition, second only to Caruso.

Lili Krauss (Pianist): b.1905, Budapest. Educated at the Budapest Conservatoire under Kodaly and Bartok. After a teaching stint in Vienna, she commenced her international performance career while studying under Arthur Schnabel in Berlin. During World War 2, she was captured in Java by the Japanese, together with her husband Simon Goldberg (violinist), and had to spend three years in a concentration camp. She is undisputedly one of the best interpreters of Mozart. Well known to the Japanese audience through her many concert performances in Japan since her first visit in 1936.

Arthur Rubinstein (Pianist): b.1887, Poland. Spent most of his later career in the United States. Infamous playboy in his youth-hood, with a flamboyant personality. Performed with an extravagant flair until retiring in 1976 at a rather advanced age.

Pablo Casals (Cellist): b.1876, Catalonia, Spain. d.1973, Puerto Rico. The greatest cellist in the 20th century, credited for establishing the cello as a solo-instrument. Educated at the Barcelona City Conservatoire. Served as the principal cellist in the Barcelona Opera House. He was an ardent supporter of the Republic during the Spanish civil war. After the victory of Franco, he declared that he would never perform again in Spain as long as the dictatorship continued, and fled to Prado, a small village in France. In 1956, he immigrated to Puerto Rico and dedicated the rest of his life to performances, education and peace movements.

Yehudi Menuhin (Violinist): b.1916, New York. Menuhin started his career as a sensational child prodigy. At the age of 13, he performed the three great violin concertos (Bach, Beethoven, and Brahms) with Berlin Philharmony under the baton of Bruno Walter. Walter praised the boy's absolutely perfect technique and mature interpretation. Menuhin's series of performances with Wilhelm Furtwangler and Berlin Philharmony, shortly after World War 2, were highly acclaimed for their profound spirituality. He visited Japan in 1960 and 1970.

Nathan Milstein (Violinist): b. 1904, Odessa, Russia. Educated at the St. Petersburg Conservatoire under the famous teacher, Leopold Auer. He left Russia following his

Berlin debut in 1925 and pursued his subsequent career in the western world. Known for his beautiful sound with clarity and transparency.

Alfredo Campoli (Violinist): b. 1906, Rome. Moved to London in 1911, and quickly won a reputation as a child prodigy. During the lean years of the 1930s he became better known for his salon orchestra. This was disbanded at the outbreak of World War 2, after which he emerged as one of the outstanding violinists of his time, acclaimed for his sugar-sweet sound and charming interpretation of small pieces. Visited Japan in 1960 and in 1966.

Kirsten Flagstad (soprano): b.1895, Norway. Following her education and debut in Oslo, she moved to New York where her career development overlapped with the rise of the Metropolitan Opera. She became most famous for her Wagner repertoire. With her transparent voice quality and serene interpretation, she also achieved historical fame for her R. Strauss lieder repertoire.

Victoria de Los Angeles (soprano): b.1923, Barcelona, Spain. Educated at the Conservatoire of Barcelona. Won first place at the 1947 Geneva Competition. Pursued an international career, mostly on the operatic repertoire. She also won acclaim for her lieder repertoire, particularly Spanish and French. Her Debussy and Ravel were reputed to be better than any French singer. Visited Japan in 1965, 1972, and in 1974.

Felix Weingartner (conductor): b.1863, Austria. Studied piano and composition in Gratz. Then, he studied under Liszt in Weimar around 1883. Appointed to the principal conductor position of the Berlin Royal Opera in 1891.

Bronislaw Huberman (violinist): b.1882, Poland. Educated at the Conservatoire of Warsaw. Then studied under the famous 19th century master, Joachim, in Berlin. In 1896, at the age of 15, his performance of the concerto of Brahms in Vienna, was enthusiastically praised by the composer Brahms himself who was 63 years old at the time. After the rise of Nazis dictatorship, he refused performances in Germany, and organized the Palestine Symphony Orchestra (Israel Philharmony today) with his fellow Jewish musicians. He was known to be the true virtuoso, combining extremely high technical proficiency with profound musicality.

Fritz Kreisler (violinist): b.1875, Vienna. Educated in Vienna and Paris. In 1939, he left Europe to escape Nazis persecution and became a U.S. citizen. One of the greatest violinists of the 20th century, with unsurpassed scale and depth. He made numerous recordings during the SP era, including some pieces composed by himself.

Albert Spalding (violinist): b.1888, U.S.A. An American violinist known for his introspective interpretation. His silky and somewhat subdued sound, was favored by the well-seasoned Anglo-Saxon audience.