ON 10 DECEMBER 1876, AT A CONCERT in Paris, violinist Marie Tayau gave the premiere of Benjamin Godard's *Concerto romantique* op.35. What made the performance special was her decision to fit her Collin-Mézin instrument with steel A and E strings. This experiment, a suggestion by the violin maker, essentially marked the start of a long-running tug of war that affected almost all string players for at least the next four decades: violinists, violists and cellists alike had to decide whether the everyday practicality of metal strings outweighed the warmth and tonal quality of temperamental gut strings. Although some of the era's top players quickly saw the benefits of switching, for others the change was gradual – and required a seismic shift in thinking to appreciate the new technology.

Gut strings, made from the intestines of sheep, cattle or goats, had been used to string instruments of the violin family since their very beginnings (although violin E strings were also made of silk). The first strings with metal windings were invented around 1660: wrapping or overwinding the gut with silver, copper or silver-plated copper wire enabled the violin's G string to be thinner and more responsive than unwound gut. In Bologna, the overwinding of the larger instruments' lower strings probably influenced the development of the violoncello – compared with the much larger violone, whose thick, unwrapped gut strings functioned best for slow-moving bass-lines, the cello's shorter string length meant that thinner metal-wound G and C strings still had the requisite tension, and their quicker response allowed for fast and nimble playing.

By the end of the 17th century, metal-wound G strings were often used on violins in France, but it was not until the middle of the 18th century that Italians adopted them. As music historian Richard Maunder noted in a 1999 *Galpin Society Journal* article: 'On 20 February 1782, Artaria's shop [in Vienna] advertised "genuine Italian" strings, making it clear that the violin G, the viola C and G, and the cello C and G were overwound.'

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THE NEXT IMPORTANT DEVELOPMENT came in the mid-1880s, when the electrolytic process was developed for cheaply extracting aluminium (spelt 'aluminum' in the US) from ore. This made another metal available for wrapping strings: before this point, pure aluminium was so rare that it was more valuable than gold. (At the time of the Washington Monument's completion on 6 December 1884, its 100-ounce cap was the largest single casting of pure aluminium ever made.) Inventors quickly seized on the metal's potential for further musical uses, and by 1886, one Alfred Springer of Cincinnati had manufactured an aluminium violin. After performing a recital on the instrument, Eugène Ysaÿe decided he liked it so much that he took it back with him to Europe.

The first documented use of aluminium in string making appears to be an advertisement by the H. Schindler Co. of Boston in the 27 January 1912 issue of the *Music Trade Review*, in which it offered aluminium wire for wrapping strings. Eight years later, US violin maker Ladislav Kaplan wrote: 'An aluminum D string should be just a trifle thicker than the G string but never as thick as the gut D. One of the reasons for the aluminum D string is to provide a string that is less bulky than the gut D, and to equalize it more with the A and the G. Aluminum wire has been found to possess just the necessary volume to produce a thinner string having the weight and the resistance of a gut D.'

'I like to feel the thick, pure gut D, as though it were a rope – it gives me a better feeling for the notes'
ADOLF BUSCH

By the turn of the century, the H. Schindler Co. was America's largest manufacturer of wound gut strings, but it was only one of many string making companies in the US at that time. The National Musical String Co., which originally manufactured the 'Black Diamond' brand strings, was founded in 1898 in New Brunswick, NJ; the Perfection Musical String Co. (makers of Wondertone, Gold Label, Black Label and Tricolore strings, which were used by the majority of American players through the 1960s) was founded in Brunswick, Indiana, in 1910; E.&O. Mari ('La Bella') started in 1913; Armour & Co. began in-house manufacturing in 1912 (the famous Chicago meat-packing firm had previously supplied gut to European makers); New York-based Muller & Kaplan was succeeded by the Kaplan Musical String Co. (Norwalk, CT); and D'Addario began in Astoria, NY, in 1918. ▷

Of course, Europe had innumerable string making families and companies: Mari and D'Addario (both in Abruzzi – the antecedents of their American offspring); W.E. Hill & Sons; J.R. Toms of Somerset ('whose violin strings have won favour all over the world'); and the pre-eminent maker of European gut strings in the 19th and 20th centuries, Giorgio Pirazzi & Sons (founded in Offenbach, Germany, in 1798), which became Pirastro in the 1890s.

HOW DID PLAYERS RESPOND to the new choices in front of them? Essentially, violinists had two decisions to make: either a gut or a steel E string; and unwound gut or aluminium-wound gut A and D strings. Cellists faced a similar choice but later: a gut or steel A string, and unwound gut or aluminium-wound gut D string. All cellists of the period began with a gut A and D but by the late 1930s most had switched to a steel A and

'I never use wire strings – they have no colour, no quality'

MISCHA ELMAN

an aluminium-wound D; many had undoubtedly switched to an aluminium D before that (as far as I can determine, no prominent cello soloist of the past used an aluminium-wound gut A, the string that Steven Isserlis uses today). All violinists used a silver-wound gut G, whereas wound gut Gs and Cs were standard for both cellists and violists, and on the double bass, As and Es were overwound.

Early photographs show the young Pablo Casals (1876–1973) using plain gut A and D strings. Although he ultimately adopted an aluminium-wound D, the cellist remained devoted to his unwrapped gut A, whose tone quality he could not abandon. (René Morel told me that when Casals lived in Puerto Rico he used Prim steel D, G, and C with his gut A, because of the extreme humidity there.) Felix Salmond (1888–1952) also stuck with a gut A. Lionel Tertis (1876–1975), the only solo violist of his day, used a similar set-up: gut A and Pirastro aluminium D, silver G and C. By 1950, however, he was advocating steel strings.

Adolf Busch (1891–1952), as related by his student Robert Dressler in Tully Potter's biography *Adolf Busch: The Life of an Honest Musician*, characterises the situation for violinists:

> Both his violins had a pure gut D and a pure gut A. He said that when he was a student, he always used pure gut for D, A and E. Then, on the advice of a lot of other violinists, he started to try the covered or the wire-wound gut strings for the A and the D, but decided he liked the pure gut better, so went back to it rather quickly for the D and A. In Europe, he always used the pure gut for the E string; but in America the pure gut Es seemed to break or go out of tune so often that he had to go over to a wire (or silver-covered steel) E when he played there. So whenever I saw him, his violin had a wire E, a pure gut A, a pure gut D and a covered gut G. He liked the feeling under his fingers of the thick gut strings and said: 'Particularly on the D string I like to feel the thick pure gut D, as though it were a rope – it gives me a better feeling for the notes.'

According to Potter, Busch preferred Pirastro or Toms strings, which were also used by the other quartet members. ▷

He explains: 'As far as I know, he used a gut E up to the Second World War, when he found difficulty in getting good strings in America. Ironically, I remember one American critic resident in England making a big deal of the fact that the Capet Quartet used gut strings and the Busch Quartet used metal. Not true!'

VIOLINISTS' FEELINGS ABOUT E STRINGS could be quite passionate, as Frederick H. Martens showed in his 1919 book *Violin Mastery*. Among the players expressing their preferences were the German-born US conductor Theodore Thomas (1835–1905), who told fellow violinist Maud Powell that he had in fact given up the violin because of the E string. Maud Powell (1867–1920) had herself switched to a steel E by 1907 after breaking several gut strings on a humid, foggy summer evening in Connecticut, declaring, 'Give me anything but a gut string!' For a while, Mischa Elman (1891–1967) continued to use all gut strings on his 1722 Stradivari: 'As to strings, I never use wire strings – they have no colour, no quality.' However, he too switched to a steel E string eventually, with a plain gut A and an aluminium-wound D.

Martens also quotes Jacques Thibaud (1889–1953) as having switched to a steel E before 1918:

> Yes, I use a wire E string. In New Orleans I snapped seven gut strings at a single concert. After my last New York recital, Ysaÿe asked me, 'What strings do you use?' When I told him I used a wire E he confessed that he could not have told the difference. And, in fact, he has adopted the wire E just like Kreisler and others, and has told me that he is charmed with it – for Ysaÿe has had a great deal of trouble with his strings. I shall continue to use them even after the war, when it will be possible to obtain good gut strings again.

Maud Powell agreed with Thibaud's assessment:

> Most people will admit that hearing a wire E you cannot tell it from a gut E. Of course, it is unpleasant on the open strings, but then the open strings never do sound well. But all said and done it has been a God-send to the violinist who plays in public.

Without having personal knowledge, it is difficult to determine exactly what brand of strings a player used. Advertised endorsements might have been genuine, but they could also have been paid promotions. Fritz Kreisler (1875–1962) – who broke two gut E strings performing the Mendelssohn Concerto in his 1888 US debut – endorsed for both Pirastro and Armour strings. According to Louis P. Lochner's 1950 biography, when Kreisler was asked if he used any particular brand of strings he replied: 'No, I find good ones wherever I happen to be. I am not a faddist.' Lochner also noted, 'In later years, however, he has consistently used strings made by a friend in Chicago.' One supposes this refers to Armour.

NO MATTER WHAT THEY MAY HAVE STATED early in the 20th century, violinist Endre Granat affirms that by the end of the First World War, Zimbalist, Enescu, Szigeti, Huberman and almost all other violinists had switched to metal E strings: 'During the war, gut strings were difficult to obtain. Ultimately practicality prevailed, steel strings improved and tuners were invented. Gut E strings have a very short life: they go false in days and pop constantly. Gut A and D strings do not have this problem. The Auer clan were among the last to switch (around 1920) but they held on to the gut A and D. By the mid-30s very few people used a plain gut D.'

Carl Flesch (1873–1944) converted to a steel E early on. He summed up the situation as he saw it in his 1923 book *The Art of Violin Playing*: 'There is no doubt, that public performance has become not only much more reliable from the technical side but also more enjoyable from the musical standpoint, since the chances of string-sagging or breaking have become so remote.'

Particularly on cello, the march of steel continued. By the 1950s most young American cellists began their studies using two steel strings and two silver-on-gut. The demise of the Precision Musical String Company, the burgeoning influence of Rostropovich, and the introduction of new brands and types of steel strings, as well as perlon, led most players to abandon gut, and only a passionate minority of cellists retained wound gut on the three lower strings. On violin an equally passionate minority has stayed with gut, and even plain gut on the A and D. This group has welcomed the resurgence of gut string manufacturing, largely propelled by the historically informed performance movement, and in recent years a number of mainstream players who were born too late to have started on gut have begun to experiment with and, in some cases, re-embrace the strings to which their forebears were so devoted. ■