Images from the Past:  
Re-discovering Some Lost X-Ray Data of Tsutomu Chiba

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再発見された千葉勉のX線口腔図

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In 2008, the former Department of Phonetics and Linguistics at University College London (UCL) vacated the premises it had occupied for nearly 90 years. The author assumed responsibility for the considerable quantity of legacy material which came to light, including film, photographs, records, printed documents and manuscripts, and in particular an undocumented and previously unknown collection of 89 glass lantern slides which forms the subject of this paper. The slides show detailed and beautifully drawn vocal-tract outlines for a wide range of speech sounds, and were evidently prepared from an extensive X-ray study. A typical slide is reproduced as Figure 1.

Fifty-seven of the slides cover the sounds of Japanese, and 32 the sounds of English. Each slide measures 100 mm \( \times \) 80 mm (4 inches \( \times \) 3.25 inches), making it unlikely that they were produced in Britain (where lantern slides were usually 80 mm square). A misspelling ‘octover’ for ‘October’ in the handwritten label on English slide 12 also suggests a Japanese origin.

A close resemblance was immediately noted with outlines for German vowels published by Chiba and Kajiyama (1942, p. 150), suggesting that the slides represent work done in the Tokyo laboratory of Tsutomu Chiba, probably in the 1930s. An examination of Chiba’s publications, however, failed to reveal diagrams identical with the slides. Large diagrams of the vocal-tract positions for Japanese sounds are included in Chiba (1934), a work evidently prepared as a resource of visual teaching materials, and diagrams of English sounds appear in Chiba (1949), a small handbook. Despite unmistakable similarities, it is clear that the slides are not merely photographic copies of diagrams to be found in Chiba’s published works.

The sequence of steps involved in making the slides can thus be established. The original X-ray images would have been negatives around 10% larger than life size; these would have been skilfully traced to produce positive (black-on-white) line drawings of the same size. Each such drawing was then photographically reduced, yielding a set of negatives (now lost) with white outlines on a black background, and an image area about 60 mm square. From these negatives both the

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slides and the paper copies found at Sophia were then produced by photographic contact printing.

Detailed comparison (accomplished by superimposing layers in a Photoshop document) confirms that both the outlines of Japanese sounds published in 1934, and the English ones from 1949—while superficially dissimilar and greatly different in size—have exactly the same proportions as the corresponding slides. Therefore a single data set underlies the slides, the Chiba prints, and the 1934 and 1949 publications.

Overall, the findings prompt two linked questions: What was the purpose of the slides, and why were they in London?

Chiba did have an early connection with UCL. Details of his registration as a student show that he entered the College at the end of the academic year 1912–1913, and then enrolled for a number of courses in English and in Phonetics in the autumn of 1913. Phonetics teaching under Daniel Jones had started in 1907. But there is little to indicate that Chiba’s interests in vowels or in X-ray studies were formed at this early stage. Daniel Jones did not put forward his Cardinal Vowel system, or make his own X-rays of vowels, until 1917. And although a course in ‘Instrumental phonetics’ was offered in the programme of lectures for 1913–1914 during Chiba’s stay, he seems not to have followed it. Furthermore, unlike some other early Japanese visitors, Chiba did not join the International Phonetic Association while in London as a student. On the contrary, the membership records indicate that he joined in 1930, more than 15 years after his time at UCL.

Chiba had a renewed connection with UCL via Harold E. Palmer (1877–1949) who was in Japan over the years 1921–1936 and established the Institute for Research in English Teaching (IRET) in 1923. Palmer is mentioned as the speaker in some of the X-rays employed in Chiba and Kajiyama (1942, p. 39). In 1935 Palmer delivered a report on the state of phonetics in Japan to the second ICPhS in London (Palmer 1936), mentioning that Chiba was unable to attend the congress, and so unable to describe “his splendid phonetics laboratory at Tokyo—probably the best equipped one in the world” and to report his “research on Japanese sounds, this containing a complete set of diagrams (oscillograms, X-ray photos, and intonation curves) for every sound or phoneme” (1936, p. 304). It is thus possible that the slides were made with a view to presentation at ICPhS, and brought to London by Palmer.

The world-leading X-rays made in Chiba’s laboratory were primarily directed at the vocal-tract modeling which is reported in Chiba and Kajiyama (1942), but Chiba was a teacher as well as a researcher, and his publications of 1934 and 1949 show him putting the research data to practical use in pronunciation teaching. The slides might, therefore, have been made as teaching aids for use with large audiences, and it might even have been contemplated to publish them commercially. The set found in London could thus have been sent to UCL for evaluation, or perhaps even for review in Le Maître Phonétique, the IPA’s journal, which was edited and published in London.

Chiba’s slides have continuing importance and value today. Not only do they preserve lost work of one of Japan’s greatest phoneticians; they contain what are still some of the very best midsagittal diagrams ever produced, and deserve to be republished. It is pleasing that the collection of slides has now been accessioned into the archives at Tokyo University of Foreign Studies, where they will be conserved and made accessible to future researchers.

References