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## Other than Ethical: STS-Oriented Approaches to Communist Audio Forensics\*

**Abstract:** This article considers the benefits of constructivist approaches to the history of audio forensics. It is argued that science and technology studies (STS) open up a new avenue of research on historical uses of sound recordings in the communist security apparatus and offer a perspective that is considerably different from the mainstream historiographical treatment of the state audio surveillance. This claim serves as a basis for discussing the Czechoslovak programme of audio forensics (1975–1989).

**Keywords:** audio forensics, STS, science and technology studies, surveillance, sound recording, criminalistics

In recent years, historians of science and technology, media theorists, legal historians, and other researchers have paid increasing attention to the historical developments in forensic science, that is, to the ways in which various scientific methods and approaches were applied in criminal investigations and legal processes.<sup>1</sup> In addition to advances in forensic technologies and analytical methods, scholars have also examined much wider interactions between forensic institutes, courtrooms, universities, political regimes, and cultural concepts.<sup>2</sup> The previ-

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<sup>1</sup> See *Crime and the Construction of Forensic Objectivity from 1850*, ed. A. Adam, London 2020; *Global Forensic Cultures: Making Fact and Justice in the Modern Era*, eds. I. Burney, C. Hamlin, Baltimore 2019; W. Ruberg, “Travelling Knowledge and Forensic Medicine: Infanticide, Body and Mind in the Netherlands, 1811–1911,” *Medical History* 57, 2013, no. 3, pp. 359–376.

<sup>2</sup> The current ERC Consolidation Project *Forensic Culture: A Comparative Analysis of Forensic Practices in Europe, 1930–2000* run by Willemijn Ruberg at Utrecht University employs the concept of “forensic culture” to capture the entanglements between forensic science and wider cultural, academic, and political practices. See the project’s website: <https://force.sites.uu.nl> (accessed 21.11.2021).

ous examinations of “forensic cultures” have paid only limited attention to audio expertise in criminalistics<sup>3</sup> and until recently have totally neglected the history of audio forensics in the countries of the former Eastern Bloc.<sup>4</sup> By discussing the historical example of the Czechoslovak Fonoscopy Department,<sup>5</sup> I argue that this scholarly neglect is the result of interrelated historiographical, theoretical, and methodological issues.

Historiographically, the study of sound and hearing in the context of communist surveillance and security policies has focused almost exclusively on the wire-tapping and eavesdropping practices of the communist police.<sup>6</sup> The Oscar-winning German film *The Lives of Others* (2006), which tells the story of a Stasi (East-German secret police) agent eavesdropping on a writer and his lover, not only shows how communist audio surveillance has become ingrained in the popular imagination, but it also reflects the mainstream scholarly treatment of the topic. A historical examination of the communist police’s sound-based research and listening practices has mostly focused on the ethical questions regarding the unequal relationship between the listener/eavesdropper and those whose voices are being listened to and recorded. This kind of research has often given precedence to the study of dissident cultures and the oppressive practices of the totalitarian regime, which put its citizens under constant surveillance. In this strand of work, the eavesdropping policemen have come to represent the Orwellian Big Brother and sound recordings have often testified to the abuse of government (and later also corporate) power and the violation of people’s privacy.

<sup>3</sup> For the history of audio forensics in the US, see X. Li, M. Mills, “Vocal Features: From Voice Identification to Speech Recognition by Machine,” *Technology and Culture* 60, 2019, no. 2, pp. S129–S160; see also *Sound, Law and Governance*, ed. L. Cardoso, special issue of *Sound Studies* 5, 2019, no. 1.

<sup>4</sup> A pioneering work on the GDR’s audio forensics research programme has recently been published by the historian of science and technology Karin Bijsterveld: “Slicing Sound: Speaker Identification and Sonic Skills at the Stasi, 1966–1989,” *Isis* 112, 2021, no. 2, pp. 215–241. The Czechoslovak programme of audio forensics is examined for the first time in Anna Kvíčalová’s “Dissecting Sound on the Quiet: Voiceprint, Speaker Identification and Auditory Objectivity in Czechoslovak Forensic Practice (and Imagination),” under review at *Technology and Culture*.

<sup>5</sup> For the purposes of my research, I translate the Czech word “fonoskopie” as “fonoscopy.” I use the hybrid term “fonoscopy” to refer to the historical department and its methods of forensic acoustics.

<sup>6</sup> See S. Schneider, “Democracy and Security in Germany Before and After Reunification,” [in:] *Routledge Handbook of Democracy and Security*, eds. L. Weinberg, E. Francis, E. Assoudeh, London 2020, pp. 97–108; *The Stasi at Home and Abroad: Domestic Order and Foreign Intelligence*, ed. U. Spiekermann, Supplement 9 of *Bulletin of German Historical Institute*, Washington 2014; V. Glajar, A. Lewis, C.L. Petrescu, *Secret Police Files from the Eastern Bloc*, Rochester 2016. For a discussion of post-communist surveillance, see, for example, J.L. Larson, “Wild Eavesdropping: Observations on Surveillance, Conspiracy, and Truth in East Central Europe,” *Political and Legal Anthropology Review* 40, 2017, no. 2, pp. 342–349.

While fully acknowledging the importance of this type of research, I argue that by focusing on the political history and ethics of surveillance, scholars have missed the opportunity to explore the historical practices of knowledge production in forensics through the theoretical and methodological lens of science and technology studies (STS) and the history of knowledge. The study of the feedback loop between culture, society, and politics as well as between scientific research and technology, allows us to better understand the ways in which complex cultural and material networks inform sonic practices, listening habits, and audio technologies.<sup>7</sup> In the remaining part of this article, I will discuss the benefits of constructivist approaches to the study of audio forensics in communist Czechoslovakia. I will argue that the STS perspective not only unveils the logic of communist audio surveillance, but more importantly, demonstrates how the new knowledge on sound and hearing was produced in forensics.

### The Czechoslovak “Laboratory of Sound”

In addition to the well-known eavesdropping practices of the communist state and secret police, whose main goal was to gather information about the contents of private conversations and phone calls, a different kind of audio expertise developed in some countries of the former Eastern Bloc and so far has not been sufficiently examined by researchers. The aim of the *fonoscopy* programmes of audio forensics, as they were called in Czechoslovakia and Poland,<sup>8</sup> was to determine the identity of anonymous speakers by dissecting their recorded voices into components that could be then “objectively” compared and examined. In doing so, forensic departments combined audio analysis with sound visualizations done by the spectrograph, which promised objective and easy-to-compare results. By briefly discussing the history and practices of the Czechoslovak Fonoscopy Department, I argue that sound recording (as a practice, technological tool, and object of analysis) played an essential role in audio forensics. Not only did it provide

<sup>7</sup> For a discussion of sonic methodologies in science and technology studies, see T. Pinch, K. Bijsterveld, “New Keys to the World of Sound,” [in:] *The Oxford Handbook of Sound Studies*, eds. T. Pinch, K. Bijsterveld, Oxford 2012, pp. 3–35; J. Bruyninckx, A. Supper, “Sonic Methodologies in Science and Technology Studies,” [in:] *The Bloomsbury Handbook of Sonic Methodologies*, eds. M. Bull, M. Cobussen, New York–London 2020, pp. 201–216; K. Bijsterveld, *Sonic Skills: Listening for Knowledge in Science, Medicine and Engineering (1920s–Present)*, Basingstoke 2019.

<sup>8</sup> The Czechoslovak Fonoscopy Department was directly influenced by the Polish term *fonoskopia*, a forensic method and an independent department developed in Warsaw in the early 1960s. The Polish department relied on the work of Stanisław Błasikiewicz, but its institutional development still needs to be examined by researchers. See A. Kvičalová, op. cit.; W. Maciejko, J. Rzeszotarski, T. Tomaszewski, “50 lat polskiej fonoskopii,” *Problemy Kryminalistyki* 269, 2010, pp. 69–83. For the Stasi programme of audio analysis, see K. Bijsterveld, “Slicing Sound.”

new insights into human voice and a means of its technological and aural dissection, but also helped to define the parameters of “objective” legal and criminalistic evidence.

The first attempts to analyze recorded voices for forensic purposes date back to the early 20th century, but a direct impetus for establishing the first audio forensic department in Czechoslovakia came from the idea of “voiceprint” popularized by American engineer Lawrence Kersta in the early 1960s. Kersta’s speaker identification is based on the premise that each human voice has such a unique characteristics that speech sonograms (that is, spectrographic images) would be able to identify speakers even if their voices were distorted or deliberately disguised.<sup>9</sup> Although the reliability of voiceprints was criticized in the US as early as in the 1960s as well as questioned by Czechoslovak audio forensics experts, the Fonoscopy Department was established in Prague in 1975 with a strong commitment to sound visualization technologies.<sup>10</sup> In reality, the new kind of audio expertise had relied on the combined use of audio analysis and voice spectrograms since its inception. As a result, the Fonoscopy Department became a one-of-a-kind sound lab and the only place in Czechoslovakia where researchers could systematically develop voice and sound identification methods.

The Fonoscopy Department did not simply copy Kersta’s speaker identification techniques, but effectively combined methods from various fields, like acoustics, electro-engineering, phonetics, linguistics, handwriting analysis, as well as music and radio broadcasting. The Czechoslovak audio forensics programme took direct inspiration from the phonetic studies of personal characteristics of speech, which Přemysl Janota pursued at the Institute of Phonetics, Charles University in Prague, in the 1950s and 1960s.<sup>11</sup> Apart from the phonetic methods of sound analysis, including the dissection of voice into phonemes and the measuring of the speech spectrum, audio forensics shared some of its methods and premises with Czechoslovak aviation research, which used speech sonograms to determine the emotional state of pilots.<sup>12</sup> Another inspiration behind audio forensics research in mid-70s Czechoslovakia was the work of phono-amateurs as well as radio and music professionals. The two groups shared their interest in recording technologies, sound authenticity, and aesthetics, which is apparent in their pioneering publication, *The Soundhunter’s ABC* from 1974.<sup>13</sup> In addition to studio and indoor recording of speech and music, the handbook also deals with the practice of field recording and the artificial imitation of sounds. The application of directional parabolic microphones in field recording, used mainly to record bird

<sup>9</sup> L.G. Kersta, “Voiceprint Identification,” *Nature* 196, 1962, no. 4861, pp. 1253–1257.

<sup>10</sup> A. Kvíčalová, op. cit.; J. Málek, V. Musilová, *Fonoskopie*, Praha 1989, p. 6.

<sup>11</sup> P. Janota, *Personal Characteristics of Speech*, Praha 1967.

<sup>12</sup> A. Kvíčalová, op. cit.; J. Šulc, “Úloha elektroakustické analýzy řečového signálu ve funkční diagnostice psychologického a fyzického výkonu,” *Československá psychologie* 1977, pp. 115–120.

<sup>13</sup> Z. Bouček, I. Rottenberg, *Abeceda lovců zvuku*, Praha 1974.

sounds, was investigated by the secret police in order to draft up a new strategy for the development of eavesdropping and wiretapping technologies in 1975.<sup>14</sup>

However, the preferred way of obtaining voice samples for fonoscopic analysis was neither bugged phone calls nor recordings made in police interrogation rooms, but controlled speech tests. Unlike in the GDR, a systematic database of speakers was not established in Prague until the 1990s, but the analysis of recorded voice samples and their comparison with the voice samples of the suspects lied at the heart of the new fonoscopic expertise. In order for the analysis to be successful, it was necessary to obtain speech samples that would be as similar as possible to the original sound recording (for example, a threatening phone call or a secretly recorded conversation). Those speech samples were produced in a controlled environment by trained fonoscopy experts, who asked the suspects to tell their life stories, read aloud, participate in a conversation or repeat certain sentences in different manners.<sup>15</sup>

Although all those summoned to the Fonoscopy Department to speak to the recording device had formally agreed to participate in the procedure, the power dynamic was clearly not neutral in these circumstances. If one examined forensic audio analysis from the victims' perspective, the findings would most likely demonstrate that the entire recording process was marked by a power asymmetry, where many people were not only wiretapped, but also had to participate in speech tests. By way of comparison, the STS perspective calls attention to a much wider network of instruments, methods, and techniques of listening, which all came together in fonoscopic dissection. Its main focus lies on power dynamics and modes of interaction that occur not only between the state and its citizens, but also across different scientific, cultural, and security domains.

The Fonoscopy Department systematically examined the limits and possibilities of sound analysis, which combined spectrographic images of the voice (showing the pitch and frequency of selected speech components) with expert listening skills. The department staff members were trained to perform a kind of listening that was different from the one required in the secret police's eavesdropping activities. More specifically, they were taught to pay attention not only to what the people in the recordings said, but also to *how* they said it, with special consideration of the speaker's voice timbre, accent, emotional state, age, speech disorders, possible occupation, manner of speaking, and the authenticity of the recording.

STS offer useful tools to describe a variety of instruments and expert skills that contributed to the advances in audio forensics research and open up a new perspective capable of producing a historical knowledge that is different from the one

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<sup>14</sup> See file no. A27/191, 1975, p. 22, Security Services Archive of the Czech Republic.

<sup>15</sup> For a detailed analysis of the practices of the Czechoslovak Fonoscopy Department, which is based on the study of archival documents and interviews with the Department's former members, see A. Kvíčalová, *op. cit.*

usually presented in the studies of communist surveillance. Sound recording, both as practice and material evidence, is approached not only as the final product of audio surveillance, but also as a tool of knowledge. At the Fonoscopy Department, the recorded speech was translated into a visual form through the sound spectrograph and subjected to thorough linguistic and aural analysis. By listening to the recorded samples, the fonoscopy experts transformed their ears into an instrument of applied science and explored the potential of sonic ways of knowing, which was further developed in other contexts.

## Bibliography

- Bijsterveld K., "Slicing Sound: Speaker Identification and Sonic Skills at the Stasi, 1966–1989," *Isis* 112, 2021, no. 2, pp. 215–241.
- Bijsterveld K., *Sonic Skills: Listening for Knowledge in Science, Medicine and Engineering (1920s–Present)*, Basingstoke 2019.
- Bouček Z., Rottenberg I., *Abece da lovce zvuku*, Praha 1974.
- Bruyninckx J., Supper A., "Sonic Methodologies in Science and Technology Studies," [in:] *The Bloomsbury Handbook of Sonic Methodologies*, eds. M. Bull, M. Cobussen, New York–London 2020, pp. 201–216.
- Crime and the Construction of Forensic Objectivity from 1850*, ed. A. Adam, London 2020.
- Glajar V., Lewis A., Petrescu C.L., *Secret Police Files from the Eastern Bloc*, Rochester 2016.
- Global Forensic Cultures: Making Fact and Justice in the Modern Era*, eds. I. Burney, C. Hamlin, Baltimore 2019.
- Janota P., *Personal Characteristics of Speech*, Praha 1967.
- Kersta L.G., "Voiceprint Identification," *Nature* 196, 1962, no. 4861, pp. 1253–1257.
- Kvíčalová A., "Dissecting Sound on the Quiet: Voiceprint, Speaker Identification and Auditory Objectivity in Czechoslovak Forensic Practice (and Imagination)," under review at *Technology and Culture*.
- Larson J.L., "Wild Eavesdropping: Observations on Surveillance, Conspiracy, and Truth in East Central Europe," *Political and Legal Anthropology Review* 40, 2017, no. 2, pp. 342–349.
- Li X., Mills M., "Vocal Features: From Voice Identification to Speech Recognition by Machine," *Technology and Culture* 60, 2019, no. 2, pp. S129–S160.
- Maciejko W., Rzeszotarski J., Tomaszewski T., "50 lat polskiej fonoskopii," *Problemy Kryminalistyki* 269, 2010, pp. 69–83.
- Málek J., Musilová V., *Fonoskopie*, Praha 1989.
- Pinch T., Bijsterveld K., "New Keys to the World of Sound," [in:] *The Oxford Handbook of Sound Studies*, eds. T. Pinch, K. Bijsterveld, Oxford 2012, pp. 3–35.
- Ruberg W., "Travelling Knowledge and Forensic Medicine: Infanticide, Body and Mind in the Netherlands, 1811–1911," *Medical History* 57, 2013, no. 3, pp. 359–376.
- Schneider S., "Democracy and Security in Germany Before and After Reunification," [in:] *Routledge Handbook of Democracy and Security*, eds. L. Weinberg, E. Francis, E. Assoudeh, Abingdon–New York 2020, pp. 97–108.
- Sound, Law and Governance*, ed. L. Cardoso, special issue of *Sound Studies* 5, 2019, no. 1.
- The Stasi at Home and Abroad: Domestic Order and Foreign Intelligence*, ed. U. Spikermann, Supplement 9 of *Bulletin of German Historical Institute*, Washington 2014.
- Šulc J., "Úloha elektroakustické analýzy řečového signálu ve funkční diagnostice psychického a fyzického výkonu," *Československá psychologie* 1977, pp. 115–120.

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