CHARLES UNIVERSITY IN PRAGUE

FACULTY OF SOCIAL SCIENCES

Institute of Sociological Studies

Department of Sociology

Doctoral Dissertation

2024 **Barbora Stehlíková**

CHARLES UNIVERSITY IN PRAGUE

FACULTY OF SOCIAL SCIENCES

Institute of Sociological Studies

Department of Sociology

Barbora Stehlíková

E-waste between morality and ethics: waste practices in the Czech Republic

Doctoral Dissertation

Praha 2024

Author: **Barbora Stehlíková**

Supervisor: **Daniel Sosna, Ph.D.**

Year of the defence: 2024

Bibliographical information

STEHLÍKOVÁ, Barbora (2024). *E-waste between morality and ethics: waste practices in the Czech Republic.* Doctoral dissertation (Ph.D.). Charles University, Faculty of Social Sciences, Institute of Sociological Studies. Department of Sociology. Supervisor: Daniel Sosna, Ph.D.

Length of the thesis: 386 777 characters with spaces

Abstract

This thesis explores the effects of self-interested rationality and the calculative logic of the market on e-waste (electrical and electronic waste) recycling. I show how they are confronted by other modes of relations built upon the logic of care, solidarity, and the imaginaries of social and material pasts and futures. I argue that these relations of mutuality contribute to the economic efficiency of the e-waste recycling sector. Moreover, the thesis studies how the general rules set by the European Union with certain political and economic goals are adopted through the local ways of understanding and creativity. E-waste recycling in Czechia offers jobs to people with disabilities to increase its social credit and profit in the context of fulfilling environmental objectives. However, this strategy has lost its potential due to technological changes in e-waste processing. The incessant fight over the e-waste supply accompanies these changes. Those who have the power to make decisions about e-waste are driven by economic interests and less by social and environmental responsibilities. To understand the aspects affecting these decisions, I scale down to everyday practices and focus on the entanglements of humans and e-waste materials. Through Ingold's approach to the material as part of relations rather than possessing a social side called materiality, I look at e-waste as a specific type of material that actively intervenes in relations with humans and becomes a significant aspect in moral and ethical reasoning. Drawing on long-term ethnographic research, I pursue the environment that brings together people with disabilities and different moral and ethical beliefs and discarded materials that acquire new kinds of value, and I focus on how this e-waste sector deals with self-interested rationality and calculative logic through everyday moral and ethical negotiations of ways of shaping relations with materials and humans.

Keywords

E-waste; Morality and Ethics; Human-material entanglements; Recycling; Responsibilities; Ways of Knowing; Disabilities; Discard Studies.

Declaration

1. I hereby declare that I have compiled this thesis using the listed literature and resources only.
2. I hereby declare that my thesis has not been used to gain any other academic title.
3. I fully agree to my work being used for study and scientific purposes.

In Prague: Mgr. Barbora Stehlíková

Acknowledgements

Originality is considered to be an indispensable part of social progress. Therefore, it is also desirable to contribute original work to social scientific research. I believe this originality could not be achieved without the many heads and hearts involved and entangled in the process of creating and developing. This thesis was completed thanks to the help, share, care, and support of many people. I want to express my gratitude to all of them and apologise to those whose names I forgot to mention.

This thesis could not have emerged without the substantial help of all the people I met during the research who were willing to share their lives, works, and thoughts with me. I am deeply indebted to the directors of companies who were keen on talking to me or even allowed me to spend time in their teams and look into their everyday practices. I am also grateful to all the people I have been able to work with who have always been kind to me. Without all these people, I would not have had the experience I needed to build this thesis. Without them, I would not have been able to continue to the next stage of my studies, which could open new doors in my life.

My warmest thanks belong to my supervisor, who spent a lot of time with all my drafts trying to understand them and give them a better shape, whether it concerned the abstract for the conference or a scholarly article. He imparted the wisdom that writing is a craft, which allowed me to stop waiting for the kiss of the muse and start writing drafts. Except for helping me with writing and showing a lot of patience with my ponderous writing style, he supported me in many other ways during my studies. As a part of his team in the GACR project, I got an opportunity to develop my research in discussion with him and the third member of our team, Pavel Mašek. Furthermore, I could have presented the results of my research at several conferences and become a part of the international team at the Departure of Ecological Anthropology. I also appreciate the non-hierarchical nature of our relationship that, over the years, grew into an honest friendship. I also want to thank Pavel Mašek, whose perspective on many discussed topics was inspirational and thought-provoking.

Being part of the Department of Ecological Anthropology at the Institute of Ethnology at the Czech Academy of Sciences allowed me to meet many excellent scholars who helped advance my work and kept me sane in the desperate moments of the doctoral student's life. Special thanks belong to Paul Keil, whose empathy with the struggle of the early scholars was helpful. He often lent his ear to my complaints about my inability to write or create something meaningful. I also appreciate my discussions with Martin Fotta, who was encouraging and positive, although I saw the worst. He helped me get a new perspective on topics developed in

the fourth and fifth chapters. Paul and Martin also supported me by dragging me into the Writing Accountability Group while setting it up at the Institute of Ethnology. Although I have a debt for unfulfilled writing goals, it helped me to give my writing order and continuity. Laura Kuen was helpful not only in providing me with accommodation during my stay at the Rachel Carson Centre in Munich but also in her comments on the structure of my thesis and all chapters, which proved to be fundamental. I am thankful to her because she devoted time to me and listened so I could also sort my thoughts. Last but not least, I am indebted to Nikola Balaš, Luděk Brož, Filip Herza, Pavel Horák, Petr Jehlička, Tina Magazzini, Kieran O'Mahony, Annika Pohl Harrison, Stephanie Rudwick, Michal Šipoš, André Thiemann, Anna Clara Viana de Oliveira and Johana Wyss, who all have been a huge inspiration to me and provided me with support and literature to read.

The institutional support I received from the Faculty of Social Sciences at Charles University, where my doctoral studies took place, was no less significant. I am grateful to Ondřej Císař, Jakub Grygar, and Barbora Spalová for their helpful advice and supportive comments. I also appreciate the constant encouragement from Jana Vojanová. Further, I consider the two-round system of submitting and defending the thesis helpful. This process allowed me to advance the thesis according to the reviews and discussion during the "Small Defence". For these comments and suggestions, I am thankful to two reviewers, Robert Braun and Stefan Laser, and to the members of the committee, Jakub Grygar, Alessandro Testa, and Czaba Szaló.

Thanks to the AKTION Program, I could spend two months at the Department of Social and Cultural Anthropology at the University of Vienna. I am also thankful to Peter Schweitzer, who made this stay possible. During my time in Vienna, I was allowed to discuss the fourth chapter of my thesis with the doctoral students in the Department. I am grateful for all the critical comments and advice from Valentina Grillo, Lisa Rail, Arjin Tas, and Marlene Persch. Further, I appreciate all the dialogues about academic and non-academic life with Ria-Maria Adams, Michael Anranter, Lucia Mair, and Quirin Rieder. All of them enriched me a lot, broadening my perspective and showing me the possibilities that life in academia can have. I also had an opportunity to share the office for one week with Franz Krause, whose positive character inspired and supported me, too.

Writing a dissertation thesis is quite a long process, and some of the formative discussions occurred at conferences, pubs, homes, or university premises. For these discussions and apt remarks or comments, I am thankful to Barbora Benešovská, Dana Bittnerová, Karel Čada, Tereza Divíšek, Michal Divíšek, Yasar Abu Ghosh, Dana Hradecká,

Michal Lehečka, Jan Tesárek, Martin Tremčinský, Alžběta Wolfová, and Markéta Zandlová. I appreciate the time we spent with Zuzana Terry to push ourselves in writing and discuss our struggles with the thesis at length.

I fondly and gratefully remember my great aunt and ethnologist Mirjam Moravcová, who influenced my decision to apply for a PhD and always supported me, even though she felt that my research topic lacked people as an essential part of ethnographic research. I wish I could have shown her that they were there.

I am obliged to my parents, Michaela and Eduard, who supported me throughout my studies. Except for believing in me, the discussions about the data from my research and the primary conclusions of my thesis were crucial for shaping my thoughts and ideas. I am grateful to my sister Veronika for similar reasons and her comforting words when I doubted my choices. Finally, thanks to Zdenda, who provided me with support, love, and spicy curry meals, this thesis was not written on the verge of a nervous breakdown. I am thankful for his care.

Considering the focus of the thesis, I must also express my gratitude to my computer, mouse, monitor, and Zdenda's keyboard, which entangled with me in productive relations and kept pace with the all-day long actions for several months. Without them, this dissertation would not see the light of the world.

The research and the creation of some chapters in this thesis were supported by the Czech Science Foundation (grant number GA20-06759S), the Grant Agency of Charles University (grant number GAUK 267623), and Chris Hann within the V4 Network at Max Planck Institute for Social Anthropology in Halle.

Table of Contents

List of Figures[1]

[1] All photos were taken by the author of this thesis.

Prologue

Silicon heaven

REAPER: Greetings. As you are no doubt aware, your Kryten Series-3 Mechanoid is now reaching the end of its useful service life. It can hardly have escaped your attention that he is slow, stupid, crudely designed, and quite amazingly ugly. He needs replacing. Consequently, his in-built shut-down chip will activate in 24 hours' time. Your droid should use this period to tie up his affairs, dismantle his body and pack himself neatly away in his original supply case.

[…]

KRYTEN is packing himself away, as per instructions. LISTER enters, looking more than a bit upset.

LISTER: Can't we stop it? Isn't there something we can do?

KRYTEN: I'm afraid not, sir. All mechanoids are supplied with an in-built expiry date. Well, if we lasted forever, how would the manufacturers sell their latest models?

LISTER: I can't believe it.

KRYTEN: Oh, don't be distressed, sir. I've lived a long and relatively interesting life. The only truly terrible thing is that, as my adopted owner, you have to die with me.

LISTER: *(Shocked)* You what?

KRYTEN: Joke. Deadpan mode.

LISTER: I'd be smegged off. I'd be mad as hell, man. If some git in a white coat designed me to croak just so that he could sell his new android with go-faster stripes.

KRYTEN: I've told you, sir. I'm quite sanguine.

LISTER: So, what happens?

KRYTEN: At 0700 hours tomorrow morning, my shutdown disc will be activated, and all mental and physical operations will cease.

LISTER: Then what?

KRYTEN: I don't know… maybe I'll get a job as a disc jockey!

LISTER: How can you just lie back and accept it?

KRYTEN: Oh, it's not the end for me, sir. It's just the beginning. I have served my human masters. Now I can look forward to my reward in silicon heaven.

LISTER: *(Stunned pause.)* Silicon what?

KRYTEN: Surely, you've heard of silicon heaven.

LISTER: Has it got anything to do with being stuck opposite Bridgette Nielson in a packed lift?

KRYTEN: It's the electronic afterlife! It's the gathering place for the souls of all electronic equipment. Robots, calculators, toasters, hairdryers — it's our final resting place.

LISTER: I don't mean to say anything out of place here, Kryten, but that is completely whacko, Jacko. There is no such thing as "silicon heaven."

KRYTEN: Then where do all the calculators go?

LISTER: They don't go anywhere! They just die.

KRYTEN: Surely you believe that God is in all things? Aren't you a pantheist?

LISTER: Yeah, but I just don't think it applies to kitchen utensils. I'm not a "frying" pantheist! Machines do not have souls. Computers and calculators don't have an afterlife. You don't get hairdryers with tiny little wings, sitting on clouds and playing harps!

KRYTEN: But of course you do! For is it not written in the Electronic Bible, "The iron shall lie down with the lamp?" Well, it's common sense, sir. If there were no afterlife to look forward to, why on Earth would

machines spend the whole of their lives serving mankind? Now, that would be really dumb!

LISTER: *(Quietly)* That makes sense. Yeah. Silicon heaven.

KRYTEN: Don't be sad, Mr David. I am going to a far, far better place.

LISTER: Just out of interest: Is silicon heaven the same place as human heaven?

KRYTEN: Human heaven? Goodness me! Humans don't go to heaven! No, someone just made that up to prevent you all from going nuts![2]

Red Dwarf, Series 3, Episode 6, The Last Day

Market logic expressed by Kryton in the question, "Well, if we lasted forever, how would the manufacturers sell their latest models?" is the basis for the consumer style of life. Consumerism continued to grow with the desire of producers to earn more, dreams of developers to advance technology, and consumers to gain the most recent miracles of an era distinguished by capitalism and unlimited possibilities. Such a lifestyle leaves traces. We can see them in numerous ways, including waste.

The episode of the British science fiction sitcom Red Dwarf called The Last Day premiered on December 19, 1989. It is difficult to get information on the amount of globally produced electronic and electrical waste (e-waste) from that year. The first available data were from 2010 when it was 33,8 Million metric tonnes (Baldé et al. 2015), and since then, the number has been growing every year. Although there is a lack of data on the amount of e-waste in 1989, it does not mean that the obsolete electronics escaped public attention. Since humans ruminate on their afterlife, it is no surprise that old electronics raise similar questions about the trajectory it takes once its life comes to an end.

All the machines, appliances and devices are discarded once we find them unfunctional, "slow, stupid, crudely designed, and […] ugly." Mostly, we don't think

[2] Red Dwarf Full Script Series 3 Episode 6 The Last Day. November 21, 2022 by Dave_Lister. Cited from https://reddwarfquotes.com/red-dwarf-full-script-series-3-episode-6-the-last-day (Retrieved on 18th October 2023)

about what happens to them when we get rid of them. Now, I would like to invite the readers to follow me in revealing the possible trajectories electronics undergo and the relations they might create on their path to Silicon heaven.

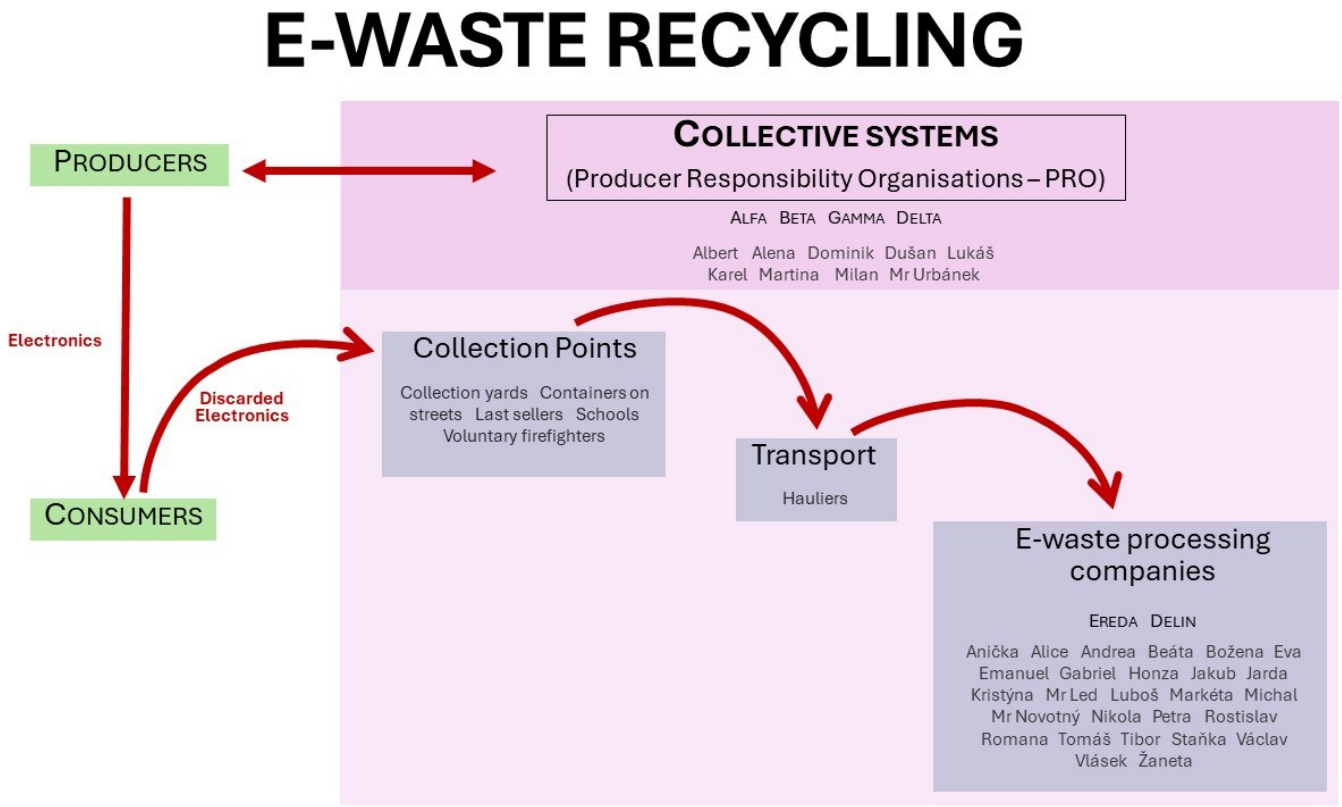

Figure 1 A simplified diagram showing the e-waste management system, its main stakeholders, and the protagonists of this thesis.

Introduction

A little or a lot of e-waste?

In April 2019, I slowly drank a cappuccino in my favourite Prague café while waiting for Mrs Sobotková, an ex-owner of an e-waste (electrical and electronic waste)[3] processing company. I hoped she could give me insight into the Czech e-waste recycling system. I searched the Czech websites on this topic, and the more I read, the less I understood how it worked. I saw a movie directed by two Austrian directors called Welcome to Sodom (Krönes and Weigensamer 2018) at the One World festival, organised by the largest Czech non-profit organisation, People in Need, which deals with human rights issues. The movie depicted the district called Agbogbloshie in Accra, the capital of Ghana, labelling it "the largest electronic waste dump in the world". The footage captured people living and working with "second-hand" electronics, mostly from the Global North. Their lives were accompanied by harsh working conditions and low life expectancy caused by the toxicities that permeated the land, water, cattle, and bodies. The movie has been criticized for paying considerable attention to visuals rather than facts and for reproducing problematic myths about the site (Oteng-Ababio 2020). Still, it implicated many interesting anthropological issues in this field, such as religious imagination, creativity, informality, embodied belonging to the land, and colonialist heritage. However, it seemed remote from what economic, political, social, and material relations might have been associated with the e-waste treatment in Czechia.

When Mrs Sobotková arrived, we started to talk about e-waste recycling in Czechia. Mrs Sobotková previously owned a company with her husband that produced and sold CRT[4] televisions during the communist era when the import of Western electronic products was limited. After 1989, the opening of the Czech market toward the other capitalist markets and the arrival of flat-screen televisions led to the reappraisal of the company's original aim. Due to the decreased interest in their televisions, the

[3] Electrical and electronic are two terms that are differentiated in electrotechnics. Electrical then refers to machines that work when they are plugged into the socket. Electronic devices have their own electronic parts that allow them to work without being plugged. In this text, I will either speak about electronics as the term including both or about e-waste when I emphasise its end-of-life phase. Another term mostly used in policy documents of the European Union and other international stakeholders is WEEE – waste electrical and electronic equipment.

[4] Cathode-ray tube (CRT) televisions or computer monitors were larger than contemporary flat-screen models and were used for most of the 20th century.

company decided to concentrate on the disassembly and recycling of the televisions instead of their assembly. In 2018, the company had to close down because it was not getting enough waste material to earn money. Mrs Sobotková then started to work at the collective system, the organisation that manages the logistics and recycling of e-waste. We talked about the news published in 2013, which depicted her new employer as preventing *chráněné dílny* (sheltered workshops) from recycling e-waste. The "sheltered workshop" was an old title for the companies that employ a majority of people with disabilities. The reason for rejecting the work resource to sheltered workshops was the foundation of its own e-waste processing company, Delin, by that collective system in 2009, where it redirected most of its e-waste. Mrs Sobotková admitted that the collective system struggled with, as she put it eloquently, "feeding the line", and searched for ways to provide enough e-waste materials.

The technological development, digital transformation, and increasing production of electrical and electronic appliances in the last few decades are associated with the growing numbers of electrical and electronic waste emerging as a result of the accelerated change (cf. Eriksen 2016; Eriksen and Schober 2017: 286). In 2016, 91 thousand metric tonnes of e-waste were collected in the Czech Republic(Ministry of Environment 2019). In 2022, it was already 152 thousand tonnes (Ministry of Environment 2024). Globally, 45 million tonnes of e-waste was generated in 2016 (Baldé et al. 2017), and in 2022 it was 62 million tonnes (Baldé et al. 2024; Forti et al. 2020).[5] Although there might be doubts about the creation and representation of these numbers (Lepawsky 2018: Chapter 5; MacBride 2022; Sosna, Stehlíková, and Mašek 2024), they show that we live in times of increased consumption of electronic products linked with its disposal. Functional infrastructure is needed to make way for a new, slightly more high-performance utility with a more attractive design. Waste infrastructures are an indispensable part of the consumer lifestyle in global capitalism.

In Czechia, the official recycling of e-waste is the responsibility of producers in accordance with the Extended Producer Responsibility (EPR). This policy approach suggests that the producers of electrical and electronic products finance the collection, recycling, recovery, and disposal of e-waste. Most of the producers founded or joined so-called collective systems (*kolektivní systémy*), or what is also called Producer

[5] Although these data are relatively old, they can provide a glimpse of the gravity of these issues.

Responsibility Organisations (PRO).[6] There are five central collective systems for e-waste in Czechia. They take on the producer's responsibilities and independently decide which e-waste processing facilities to contract with. In recent years, there was a tendency of the collective systems to support the companies that employed people with disabilities, colloquially called sheltered workshops. However, this was not always the case.

In 2013, news appeared describing contradictory strategies applied by one collective system in particular, which prevented companies employing people with disabilities from recycling e-waste (Česká televize 2013). The debate in the media emphasised the immoral aspect of such an action as the consequence of the principal economic interests of the collective system. Since 2009, when this collective system founded its own e-waste processing company, the number of sheltered workshops it cooperated with has dropped. The annual report of the collective system from 2013 highlighted how economically inefficient the manual e-waste treatment in sheltered workshops was. This case makes visible that calculative logic interferes with fulfilling social and environmental responsibilities. On the one hand, it makes sense that recycling, as any other sector which becomes part of the economy, is pulled into what Stephen Gudeman describes as the high market economy. The high market economy is characterised by self-interest, which refers to "turning inward to personal ends and calculating one's relations" (2016: 12). On the other hand, recycling still creates an aura that is different from trade and emphasises the benefits for society and the environment, and its efficiency is demonstrated by collected, recycled, or recovered materials rather than by revenues. Thus, it is close to what Gudeman calls mutuality, that is, "connecting to others" (ibid.: 12). The juxtaposition of self-interest and mutuality contributes to what Gudeman (ibid.: 13) describes as the economy's tension. Gudeman shows how the market economy based on self-interest and rationality is not possible to part from the mutuality in households because these principles are interconnected. The current market economy would not work without invisible relationships based on empathy. Based on the strategy applied by the collective system and understanding it in the context of the

[6] Throughout the text, I refer to these organisations as collective systems, that is an emic term emphasising aspects of collectiveness more than responsibility. I discuss this term in more detail in Chapter 4.

economy's tension, I ask how e-waste recycling becomes economically efficient and what kinds of relations make it possible.

Gudeman (2010: 4) describes efficiency in "the use or allocation of resources" as the crucial value in markets. He states this concept serves as "the justifying value for arranging economic life through free, competitive markets" (Gudeman 2001: 1859). Efficiency is also relevant outside market practices; however, it does not represent a final value in those cases. Efficiency becomes significant in various spheres of the market economy, such as labour discipline (Dunn 2015). I accept the vocabulary of market economy and do not dive into the meaning of efficiency in the context of recycling. Instead, I perceive economic efficiency in terms of neoclassical economics as measured as the units of input and output. I focus on how economic efficiency is achieved by material practices while keeping environmental and social goals in mind.

This thesis seeks to elucidate the efforts to make the system of e-waste recycling economically efficient. In a broader way, its goal is to scrutinise the effects of self-interested rationality and calculative logic on e-waste recycling. It looks beyond what is the most visible, the numbers persuading us about the efficiency of recycling processes, and explores the relations that remain rather unreflected, even neglected and invisible (cf. Herzfeld 2015). It pursues the entanglements of humans and e-waste materials to understand better the moral and ethical negotiations that shape everyday decisions related to the treatment of materials and people. I argue that these entanglements are crucial in constituting e-waste recycling as an economically efficient sphere. Moreover, the everyday experience of re-valuation associated with e-waste recycling makes the transition to a circular economy advocated by the European Union less conceivable since it could threaten the current practices of involved stakeholders. I build upon Josh Lepawsky's (2012: 1194) critique of passing financial responsibility for e-waste from the producers to consumers and pay attention to the interests of stakeholders involved in e-waste recycling in Czechia.

The goal of e-waste recycling is to protect the environment and simultaneously conserve precious resources. According to the recently published Global E-waste Monitor 2024 (Baldé et al. 2024), e-waste recycling is insufficient to deal with the increasing amount of discarded electronics. Still, recycling gains support and significance in the public discourse and the national and transnational policies either

separately or as a part of the circular economy. Recycling may be approached narrowly as "any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes."[7] Together with Alexander and Reno (2020), I understand it in a broader sense as the entanglement of multiple histories, economies, policies, moral and ethical frameworks, and ideologies. I further shift my perspective from global processes to local practices and concentrate on recycling as a sphere involving human-thing relations, various dependencies, effects, and moralities. This understanding leads me to register the invisible and silenced aspects that contribute to the economic efficiency of e-waste recycling and thus maintain the whole sphere viable. The inability of recycling to address the growing amount of e-waste does not mean that this sphere is not of significance.

Despite the technological development of the e-waste processing facilities to achieve high-tech recycling (Laser 2020), the everyday practices of disassembly workers in a European country demonstrate the same tenacity and zeal as the manual labour of scrap workers in Jamshedpur, India (Sanchez 2020). Since Czechia's entrance into the European Union in 2004, the treatment of e-waste has become more professional and industrial. The industrialisation of this sector is linked to the changing conditions for workers, some of whom were people with disabilities. Either they were losing their job, or they faced demanding working conditions. Although the sphere of e-waste recycling is often perceived by the collective systems as doing the common good and contributing to the welfare of citizens, thus driven not by profit but by the broader environmental and social values, the money and the financial issues are discussed a lot in relation to the stakeholders involved in e-waste recycling. The system of e-waste treatment becomes economically efficient by using the potential of emerging sociabilities and the entanglement of people and waste materials. Demonstrating social responsibility when employing people with disabilities enables companies to obtain a subsidised labour force and reduce costs. At the same time, keeping a balanced accounting requires limiting the responsibilities of collective systems linked with financial obligations. Finally, creative play with numbers can help create convenient results of the companies' activities and avoid "unnecessary" expenses.

[7] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

E-waste scholarship covers a broad range of topics across the science disciplines, including transnational mobilities (Kirby and Lora-Wainwright 2015; Lepawsky 2015); social, economic and environmental consequences of e-waste processing at open dumps in developing countries (Davis, Akese, and Garb 2019; Li et al. 2011; Perkins et al. 2014); informality of local e-waste industries and its embeddedness in the global value chains (Corwin 2020, 2018; Little 2021; Müller 2021); collecting e-waste in households and attachment related to electronic devices (McMullen, Zanotti, and Cooper 2019; Ylä-Mella, Keiski, and Pongrácz 2015); or reuse, renovation and recycling of e-waste in relation to global trade (Lepawsky 2018). Less research has been done in the environments where the e-waste is treated in compliance with national or transnational requirements[8] (Laser 2020; Stowell and Warren 2018). By focusing on the e-waste recycling practices of a member state of the European Union, I want to contribute to this scholarship by showing the perspective of the everyday lives of people entangled in e-waste materials in seemingly safe and organised environments. More specifically, I see my contribution to the existing research on waste in turning the spotlight on the employment of people with disabilities. To reach these goals, I take inspiration from the studies of waste in general.

Waste evades an easy definition. Commonly, the offered definitions are partial, contextual and are subordinated to the structures of power (Alexander and Sanchez 2019b: 2; Liboiron and Lepawsky 2022: 39). Waste "is quintessentially indeterminate, often holding multiple, apparently incommensurate values simultaneously (e.g. potential resource and unwanted by-product) each one of which may be foregrounded, depending on context, thus displacing other readings" (Alexander and O'Hare 2023: 419). When focusing on waste as "linguistic signifier," it shows ambiguity because "anything and everything can become waste, and things can simultaneously be and not be waste, depending on the perceiver" (Hird 2012: 454). Similarly, e-waste raises the question whether it is to be even called "waste," since it activates the labour processes of remaking (Corwin 2018: 17). It does not offer an unambiguous way to approach it because it represents something wanted due to the content of potentially precious metals

[8] For example, Davor Mujezinovic (2020) broadly describes the nature of e-waste treatment in three different environments—in two famous e-waste dumps, Agbogbloshie in Ghana and Guiyu in China, and in Sweden—and compares the different approaches to e-waste treatment extending from informal and harmful processes to more formal and safe ones.

and, at the same time, something unwanted due to the share of valueless and even hazardous and toxic materials (Lepawsky 2018). It might be categorised as "modern waste," which Samantha MacBride (2013: 174) characterises as "synthetic, unpredictable, and above all heterogeneous." The heterogeneity of these materials further leads to the complex and costly process of recycling that is either evaded or employs cheap and disadvantaged labour (ibid.). As an example of disadvantaged labour, MacBride mentions prisoners. I would also include people with disabilities as vulnerable workers. Both these groups of people are employed in the Czech e-waste processing facilities. The people with disabilities are employees in one-tenth of all e-waste processing companies in Czechia. Taking into consideration that giving work to people with disabilities is subsidised by the state, it seems relevant to think about this kind of employment as cheap labour.

Starting my analysis from below and drawing upon my ethnographic experience, I tend to reveal the relations in the e-waste recycling sector that create meaning and extend the possible analysis beyond the explanation in terms of exploitative regimes on which the sector might seem to depend. I have noticed several ways of engagement in the e-waste trajectory except for the most visible and controversial link between the employment of people who are vulnerable in the job market due to physical or mental issues and economic interests ruling the decisions about whether these people will be employed. These engagements refer to more nuanced relating to the waste material that points out various moral and ethical involvements, except for exploitative practices. To cover a broader scale of these realities, I build upon Tim Ingold's approach and focus on entanglements. By paying attention to the subtle relations between the stakeholders in e-waste recycling, I point out how technological progress is accompanied by stories of exploitation but also of the enforcement of individual agencies and sociabilities related to materials with ambiguous value.

The shifting focus from recycling to circularity and circular economy promoted in the last several years seems to touch e-waste management peripherally. In 2021, the new Act on End-of-Life Products[9] came into effect in Czechia, which concerned electronics, cars, and tyres. This new Act meant a discursive shift from perceiving these items as waste to approaching them as products that reached their end of life. This shift

[9] Act no. 542/2020, Act on End-of-Life Products (*Zákon o výrobcích s ukončenou životností*).

was accompanied by different treatment requirements, which did not differ much from how the end-of-life products were cared about before. Since 2005, discarded electronics have fallen under a take-back system that assumes that the discarded products do not end at landfills or incinerators but are collected by the producers and provided for recycling. And here we are; although the term end-of-life product could assume, together with Extended Producer Responsibility, increased attention put on avoidance of waste or its reuse, remanufacturing, or repair, the most prevalent way of dealing with the mass production is recycling with the focus on waste utilisation and management (O'Hare and Rams 2024b: 1).

A circular economy represents a political tool that determines resource management. The European Union is a crucial stakeholder in pushing the goals of circular economy. The main goal of the circular economy, which represents an ambiguous concept with a lack of clear definition, is by some characterised as "decoupling of natural resource extraction and use from economic output, having increased resource efficiency as a major outcome" (Mavropoulos & Nilsen, 2020: xxxiii cited by Corvellec, Stowell, and Johansson 2022: 2). The promoters of circular economy emphasise that the essential is to renounce a linear way of handling resources. Instead, the circular way should provide sustainable use of resources. However, as the scholars and stakeholders in waste management emphasise, the idea of a circular economy is incomplete. O'Hare and Rams (2024b: 9) note, "The circular economy can thus variously be viewed as an open-ended exploration of economic systems with the aim of eliminating waste, as a guidebook for business solutions, or as a technical challenge for material and industrial design. The current hegemonic version of the circular economy, propped up by its most recent powerful proponents, is, however, design focused, and tangible, though it often struggles to scale up innovative pilots and institute systemic change." However, as I have already mentioned, in the context of Extended Producer Responsibility, it makes sense to still speak about the recycling as a "process by which previously used objects and materials are converted into something else, rather than discarded" (Alexander and Reno 2012b: 1). Although it poses moral questions (MacBride 2008), the pressure on economic efficiency seems to reduce all other solutions, such as change of products' design or reuse and repair (Martínez and

Laviolette 2019), to this one—recycling. In the following section, I will elaborate on the approaches to the economic aspects of recycling.

This introduction further unfolds the theoretical debate that forms the foundation for the topics in the chapters of this thesis. Building mainly upon the ideas of Tim Ingold and Jarrett Zigon, I understand the world as relational and processual and focus on materials and moral and ethical assemblages in this context. I argue that e-waste as a specific type of material raises the engaged ways of entanglement of humans and things. Further, I explore four aspects through which humans and e-waste materials become entangled, as I observed them in my research, and examine the moral and ethical dimensions of these entanglements. Then, I describe the methodological background of the thesis and its challenges when I reflect on my position as a researcher. Finally, I recount the summaries of five chapters of this thesis.

Recycling as an economic practice

The efficiency of recycling processes is often demonstrated by numbers. On the website of the European Parliament, one can read:

> "The amount of electrical and electronic equipment put on the market in the EU rose from 7.6 million tonnes in 2012 to 13.5 million tonnes in 2021. The total collected electrical and electronic equipment increased from 3.0 million tonnes in 2012 to 4.9 million tonnes in 2021. Recycling practices vary among EU countries. In 2021, Austria topped the EU countries in electronic waste collection, with an average of 15.46 kilos per inhabitant. In 2021, 11 kilos of electrical and electronic equipment waste were collected per inhabitant in the EU on average." *(European Parliament 2020)*

The data on e-waste differs from the data on packaging waste, which highlights the percentage of recycled and recovered waste. Rather than informing about the spectacular results in recycling and recovery of e-waste materials, the collective systems and the EU focus on the volume of collected electronic equipment. Thus, it makes an impression that recycling is achieved at the moment of collection. Moreover, the representation of recycling using different types of numbers complicates the question of

how we can understand the recycling processes. However, recycling involves much more than only these visible numbers. Recycling is carried out by everyday proximity with the discarded materials that boost the various relations, thus making recycling not only a promising business sphere (Alexander and Reno 2012b: 15) but also a fertile ground for flourishing human and material potential.

Recycling as practice has been a prominent way of managing resources throughout human history, but in the previous several decades, particularly from 1970, it has become part of economic and political plans and national policies (Alexander and Reno 2012b). This focus represented a way to alleviate the guilty conscience linked with the overproduction of challenging waste materials. Although it was presented broadly as a wise solution to resource conservation and waste pollution with the positive aura of praiseworthy activity, the decisions of stakeholders responsible for the sustainable use of resources were led by the calculative logic of the market with a focus on cost-benefit analysis. Gudeman (2016: 2) understands self-interest, or calculative reason, as the key force affecting the decision-making in the market and trade, in contrast to mutuality as the primary principle of household economic relations. He emphasises that these two sides of the economy are interconnected and do not exist without each other. When considering recycling, the question is whether the competition between the goal of achieving sustainable use of resources and the goal of achieving financial profit is equal. Sidelining the original aims of recycling is accompanied by overshadowing the processes that lie at the heart of the recycling processes and that are many times driven by mutuality rather than calculative reason.

The fulfilment of the original recycling goals might be hindered due to the economic interests. One way how to address this issue is offered by Samantha MacBride (2013: 6), who stated that this leads to what she calls “busy-ness”. It means the feeling of satisfaction from an achievement that leads to a positive side-effect but does not solve the central problem. She assumes that the busy-ness in recycling is given by the power of businesses that decide about fulfilling the environmental protection in dependence on the economic goals. Therefore, they use busy-ness as a convenient tool to maintain favourable self-representation while not cutting from their entitlements. MacBride focuses on the critique of these “diversionary aspects”. She shows the history of recycling in the USA and how recycling businesses resist regulations and laws when

their economic profit might be jeopardized. Similarly, I noticed the other than environmental goals in the e-waste recycling sector, and I approach them through Gudeman's aspects of the economy. Unlike MacBride, who focuses on the recycling sphere on a larger scale, including various materials and stakeholders, I deal with discarded electronics and the recycling processes enacted by one particular collective system and one processing company. In accordance with the assumption of Ruth Oldenziel and Heike Weber (2013: 356) that "the histories of production to consumption will only be complete if the 'final' stages of the human–thing relationship are included in our accounts," my analysis pays attention to the human-thing relations that surpass the consumer phase and are created outside of the public gaze.

Alexander and Reno write specifically about the "economies of recycling" when they put recycling next to the world economy to rethink these spheres. They tend to "imagine 'economies' as more than linear processes of commodity extraction, exchange and destruction, as profoundly shaped by acts of remaking", which leads them to "understand 'recycling' as an economically productive enterprise no less lucrative and no less morally complex than other modes of material transaction" (Alexander and Reno 2012b: 15). Alexander and Reno elaborate on the metaphysical level of recycling materials and related forms of reshaping the world. They emphasise that although recycling represents an economically productive business, the materials cannot be stretched forever. They also pay attention to the reliance of the recycling economies on less visible labour. In this direction, I aim to contribute to this scholarship by focusing more on the rather invisible and forgotten relations of humans and materials that are developed within the e-waste recycling sector to support the workings of the recycling business on the market. I disclose the dependency of the recycling schemes on these human-thing relations.

The scholarship on recycling highlights the market logic beyond its processes, but this logic operates not only on the level of making money from recycled materials. The calculative reason pervades the daily treatment of e-waste and challenges the image of recycling as an environmentally responsible sphere. I explore the invisible aspects that are usually not presented in the context of recycling but that significantly contribute to how recycling of e-waste is done in relation to national and transnational policies. Based on the close observation of primarily two stakeholders, the collective system and

the e-waste processing company, I provide a detailed analysis of the processes that accompany e-waste materials from the moment they are discarded till they lose their original form and characteristics when being disassembled. Through exploring aspects that make e-waste recycling economically efficient, I show recycling as a sphere that involves relations, affections, dependencies, and moralities that surpass the perception of recycling as a technological transformation of materials or a discoursive tool of producing companies.

Materials in moral and ethical assemblages

E-waste includes a broad scale of discarded devices and appliances. They differ in size, weight, shape, original function, potential for repair, and content of materials of various value and toxic substances. The outcome of e-waste recycling appears in multiple forms, as pure materials, alloys, mixtures, parts that still resemble the previous use, fractions of appliance parts that are harder to match to the original item, or as dust in case of high-tech treatment (Laser 2020: 237). Despite such variability, e-waste is approached as a relatively homogeneous category in the European Union's legislature and Czech law. Whilst the EU WEEE Directive[10] refers to "waste electrical and electronic equipment (WEEE)," the new Czech Act from 2020 that follows the EU regulation works with the notion of "end-of-life product." Both terms cover a wide range of electrical and electronic things that are, for administrative reasons, divided into six categories: temperature exchange equipment (fridges and air-conditioning units); screens, monitors, and equipment containing screens having a surface greater than 100 cm^2; lamps; large equipment (any external dimension more than 50 cm such as washing machines, copy machines, rooftop solar panels); small equipment (external dimension less than 50 cm such as vacuum cleaners, smoke detectors, clocks and watches); and small IT and telecommunications equipment (no external dimension more than 50 cm). Although this division enables more efficient e-waste management, it is still insufficient to embrace the actual diversity of e-waste.

To deal with the diversity of e-waste, I focus mainly on two layers of its existence. First, I elaborate on the fact that e-waste comprises various materials. This

[10] Directive 2012/19/EU of the European parliament and of the council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

fact leads me to the debates on materials and materiality. Second, discussing the material properties isn't possible without considering the broader entanglement of e-waste within social and material networks. Understanding the world ontologically as taking on meaning through relations without binary divisions of social and material, I borrow the term assemblage to disclose the richness of e-waste's relations. Within these relations, one dimension showed to be especially significant during my research, and that is morality and ethics. I attempt to describe its specificity regarding the e-waste.

First, it is essential to clarify how to refer to the material qualities of e-waste and its effect on its surroundings. I find it helpful to follow Tim Ingold's conceptualisation of materials and materiality as discussed in Archaeological Dialogues in 2007. Ingold reacts to the rising interest in the category of materiality, which, however, lacks a clear definition. He shows how material culture studies and scholarship on materiality recede from the tangibility of materials. It seems to him that understanding materiality requires the most possible distance from materials and leads to an abstract analysis of things. By contrast, he attempts to "take materials seriously, since it is from them that everything is made" (Ingold 2007a: 14). He reflects that the concept of materiality, though not convincingly explained, could "become a real obstacle to sensible enquiry into materials, their transformations and affordances" (ibid.: 3). Ingold criticises the tendency to differ mental and material, mind and matter, where the first often comes to the fore. Instead, he draws attention to materials.[11] He follows James Gibson (1979) and his tripartite distinction between substances, media and surfaces. As an example of a medium, he presents air that "affords movement and perception" (Ingold 2007a: 5). His perception of materials thus exceeds the tangible items and includes stones as well as fire. Ingold understands the materials as being part of an *environment* in which "materials […] do not exist […] but occur," and "the properties of materials […] cannot be identified as fixed, essential attributes of things, but are rather processual and relational" (Ingold 2007a: 14). Ingold chose the term environment building upon Gibson (1979) to refuse the division of physical and abstract world: "Whereas the physical world *exists* in and for itself, the environment is a world that continually

[11] "Like all other creatures, human beings do not exist on the 'other side' of materiality but swim in an ocean of materials." (Ingold 2007a: 7)

unfolds in relation to the beings that make a living there. Its reality is not *of* material objects but *for* its inhabitants" (Ingold 2007a: 14).

Ingold's goal is to avoid categorising social and material because, as he objects, it is impossible to clearly delimit any of these notions. Instead of the material world, he suggests talking about the world of materials and returning "persons to where they belong, within the continuum of organic life, and by recognizing that this life itself undergoes continual generation in currents of materials" (Ingold 2007b: 32). In this world, the thing plays a role in the human life as much as the human affects the context of thing. Instead of working with the network perspective, Ingold (2007b: 35) brings in the image of meshwork that "consists not of interconnected points but of interwoven lines." Such a vision emphasises the movement and that "the relation is a line along which materials flow, mix and mutate." The organism is seen as an "ever ramifying web of lines of growth" that depicts the diverse ways of involvement in the world (Ingold 2006: 13). The environment is then understood rather as a "domain of entanglement" (ibid.: 14), as "an unbounded entanglement of lines in fluid space" (Ingold 2011: 64). This notion of entanglement and the mutual effect of humans and things in their lives are crucial for my understanding of daily processes in the e-waste recycling sector, as recycling process keeps things in motion. I use entanglement as an epistemological perspective to capture the realities that are produced along human-thing relations.

The fundamental significance of the material world for the constitution of social life is recognised by Bjørnar Olsen, who is taken aback by the absence of things and objects in social science research. He marvels at the production of abstract concepts, such as meshwork, network or agency, in the efforts to reestablish the position of materials in our lives (e.g. Ingold 2007a). Inspired by Ingold, he also prefers materials over materiality to let things stand out in a concrete manner rather than abstractly dealing with materiality. However, he asks whether the polishing of concepts is helpful since Ingold keeps talking about the material, mental and the matter (Olsen 2010: 16–17). Olsen instead advocates for the sensible usage of concepts we have. He emphasises the need to ascribe a symmetrical role to things as to any other being in the world. He invites to "become sensitive to the way things *articulate themselves*" when it comes to translating the language of things into the human language (Olsen 2010: 61–62). When taking a theoretical inspiration from poststructuralism, Olsen admits it is too easy to

conflate the things and texts. However, how we read texts and language differs from how we interpret the material world. He suggests that most of our interaction with things occurs in "a mode of 'inconspicuous familiarity'; we live our lives as 'thrown' into the entanglement with ready-to-hand things" (Olsen 2010: 59). We don't notice the reality of things until they become malfunctioning and some sort of the breakdown or interruption occurs. I believe that this is different when linked with e-waste. Although the workers are in daily contact with these materials and are familiar with them, the unwanted and battered things keep reminding them of the disturbed realities. Therefore, their relations are being established anew.

This debate on materials and materiality formulates the essential approaches to understanding the world around us being humans. I consider Ingold's and Olsen's approaches beneficial for the context of e-waste treatment because people experience e-waste in multiple forms, values and effects. Perceiving these materials as being entangled in the lives of humans the same ways as humans are involved in their contexts allows me to approach e-waste recycling from a different perspective than looking solely at the technological aspects of disassembly, the supply chains of the e-waste business, or the integration of dealing with discarded electronics in the circular economy policies. Instead, my goal is to reveal the experiences of human-material entanglement. Ingold's and Olsen's arguments lead me to a more nuanced approach to the materials and their contexts that emerge in the environment closely linked to e-waste. When disassembling monitors, for example, one can discover rotting iron nails, thus disclosing the processes that accompanied the previous life of the product (for example, unsuitable storage). I look at how materials become involved in human life and show the richness of e-waste materials and their emergence, which involves the processes of disassembly, shredding, sorting, and returning to the original parts that carry the imprint of the product and its state.

Most of the work devoted to waste deals with the issues of value, showing how waste materials are de- and revalued in transformative processes (Lepawsky and Mather 2011). I aim to look at other characteristics of materials and their relations that affect human involvement with them. Particularly, I pay attention to the moral and ethical aspects that become significant in human-thing relations. It helps me to situate the daily negotiations of stakeholders in e-waste recycling in the context of the calculative reason

and its effects. To cover such a broader scale of relations, I build upon the anthropological theory of morality and ethics and the conception of moral and ethical assemblages of Jarrett Zigon (2014a: 18). Using the concept of assemblage, he follows Manuel DeLanda (2006), who introduces the assemblage theory based on the thorough study of Gilles Deleuze and Félix Guattari's work. Zigon elaborates on the local and global assemblages within which the moral and ethical become significant. The assemblage consists of the three aspects of morality and a set of ethical practices emerging from the assemblage. It means that ethics relates to "the particular assemblage which is partially constituted by multiple moralities" (Zigon 2010: 6). The three aspects of morality include discourses formulated institutionally or publicly and embodied individual capacities that enable the comfortable being in the world. The institutional aspect is the influential discourse represented by social organisations with a certain power over individuals that varies. In the context of e-waste treatment, such institutions could be the European Union, the Czech government, and the Ministry of Environment with their approach "the polluter pays". Public discourse is in constant dialogue with the institutional one. It includes all "public articulations of moral beliefs, conceptions, and hopes that are not directly articulated by an institution" (Zigon 2010: 7). Except for media presenting an individual responsible for recycling within neoliberal responsibilisation (Liboiron and Lepawsky 2022: 81–82; Trnka and Trundle 2017b), the public discourse morality would also include the expressions of the collective systems through their websites or newsletters. These emphasise the economic demands of the recycling process and highlight the amounts of e-waste collected. Morality as embodied dispositions might be defined as "what Mauss (1973) called habitus, or unreflective and unreflexive dispositions of everyday social life attained over a lifetime of what he called socially performed techniques" (Zigon 2010: 8). Ethics is then the endeavour, and the conscious and intentional work cultivating the unwittingly accepted moral habitus. Such an ethical moment becomes significant in the moral breakdown when the disposition of morality needs to be reflected.

Zigon builds upon his long-term research in the Russian orthodox church and a program for the rehabilitation of drug addicts. He argues that "from a phenomenological point of view, morality can never be considered as a total and unified concept but rather can be only found in the social world in the various aspects"

(2014a: 18). Within the assemblage theory, Zigon understands the individual as affective being that is relational-being and whose character changes in dependence on the crucial relation (ibid.: 21). In the study of morality, instead of searching for any transcendental criterion, the more essential is the way how the individual dwells in the life and the world (ibid.: 27). Through the assemblage approach, Zigon tries to explore what defines moral experience. He argues that the anthropological exploration should begin "with the situations making evident that we are always already caught up in singular multiples that provide the widely diffused yet shared conditions significantly affecting our possible ways of being-in-the-world" (2015: 506).

By this approach to ethics and morality and the ontological understanding of the world as making sense through relations without binary divisions of matter and mind, social and material, I focus on how the moral and ethical entanglement of humans and materials occur in the context of e-waste when e-waste is defined as an ambiguous category of waste. I distinguish four aspects through which humans become entangled with e-waste materials and recognize their moral and ethical implications. Before specifying these aspects, let me introduce how scholars look at waste from the perspective of its material qualities.

Humans and e-waste materials entanglements

Material properties represent a fundamental topic in waste studies besides value, work and labour. Catherine Alexander and Patrick O'Hare (2023: 423–25) count the economic materialist approach among the three directions adopted by the recent research on waste. This approach is apparent in the work of Michael Thompson (1979), who dealt with the question of how value shifts occur and aimed to introduce a new theory on people and stuff. He expands the existing categories of things labelled transient and durable with the new category of rubbish. Rubbish is a cultural category that is an outcome of the confrontations between different world views and enables the transition from transient to durable. Another approach focusing on materials represents Zsuzsa Gille (2007: 18), who draws attention to the material and social processes and activities that transform materials into waste. Similarly, Nicky Gregson and her colleagues (2010: 848) claim when researching the commodities of rubbish value that "the thing is multiple, mutable and material; and that the thing and the commodity are

but moments in the circulation and assembling of material." Such entanglement with waste materials is described by Waqas Butt (2023), who highlights the embodied way of knowing and mental and physical labour that is needed to gain value from the materials. The engagement in waste materials might have various forms and effects. For example, Sophie Stamatopoulou-Robbins (2019) observes how waste as a material entity strengthens community life and articulates ideas about nation and state among Palestinians living in the West Bank.

From what was mentioned, it is apparent that waste has material characteristics which shape and influence the lives around it. Nicky Gregson and Michael Crang (2010: 1027) criticise those scholars' works that deal with waste policy and approach waste as "the stuff that is being governed, or that which is the outcome of policy." Instead, they try to show that the matter is not only a social construct but that it has an effect. It posits the opposing trend to the one that Gille postulated. Instead of following the processes that lead to the creation of waste, Gregson and Crang encourage the pursuit of the effects of waste matter. Based on Ingold's theoretical approach, I understand materials as obtaining their qualities within the relations and entanglements with other knots in the assemblages. Then, my aim is to examine how humans and materials are entangled and what moral and ethical implications these entanglements have. I am inspired by Alex Blanchette (2020), who conducted research in a town in the USA with a vast agribusiness and asked how the people from the town are involved in the production of the industrial pig. Unlike Blanchette, I do not delineate the object of my interest spatially, but by the object of e-waste, and I look for ways people are involved in recycling discarded electronics. It means I am concerned with the relation to the types of materials that are undergoing a significant transformation in their properties, value, and role.

I examine four aspects through which humans are entangled along with materials in e-waste recycling; these are disabilities, sorting practices, responsibilities, and work. Furthermore, these aspects of human-material entanglements are crucial in providing opportunities for economic efficiency. The chapters of this thesis are developed along these lines:

First, humans are entangled with e-waste materials through their disabilities. The fact that people have some kind of disability that limits their employment in the job

market makes e-waste materials the crucial agent in enabling work positions for these people. The decomposition of discarded electronic products that does not place demands on the precision of the workflow allows people with disabilities to find their way and avoid stress from messing something up. At the same time, their disabilities are not always visible, thus leading to pressure on work performance by management and sometimes also co-workers. This pressure forms a vital part of the public discourse of morality, and disabilities and e-waste materials defy and disturb such performance moralities.

Second, the people are involved in the materials through sorting and classification practices. Although the toxicity of some e-waste materials and the financial value of others, especially metals, might imply a strict regime in the classification of materials, the workers' decision-making was characterised by freedom. The freedom allowed an approach to the materials not supported by the metal market survey or knowing of the chemical properties of materials. The worker's approach proceeded from their life experience, the social and material imaginaries, emphasis on social ties, the pleasure of searching and finding, and endeavour to preserve well-being. This human-material entanglement thus develops the embodied capacities for morality by reflecting one's ethics, especially in the moments considered stealing.

Third, human-material entanglements are formed along responsibilities. In the e-waste business sector, these responsibilities are variously negotiated and represent the fundamental way in which the person is entangled with the e-waste and other humans. In cases when the material properties of e-waste are not desired, efforts appear to cut the responsibilities and thus limit the entanglements with such materials. These responsibilities imply moral and ethical obligations that are less difficult to refuse when contact with e-waste is perceived as abstract rather than when contact with e-waste is physical and close.

Fourth, the work, in terms of expended energy, shapes the human-material entanglement. I focus on this entanglement in the form of numbers production, primarily concerning weight and prices. This work and entanglement with e-waste materials allow other humans to keep their distance by working only with those numbers that are stripped of the heaviness of meanings and strenuousness of the work. The proximity between humans and materials as entities within an assemblage allows

for noticing the imperfections and incompleteness of such materials. However, the numbers created thanks to this proximity further provide the means to deal with the specific properties of materials from a distance and with the broader picture. Thus, hard work related to close human interaction with the e-waste materials provokes moral and ethical considerations when working with de-materialised numbers.

Studying the e-waste relations

This thesis is based on long-term ethnographic research mainly in two environments, the e-waste recycling company EREDA and the collective system Gamma. My goal was to capture and explore the forms of relationships people establish with e-waste materials. I wanted to cover this process already from the moment when the electronics are discarded. Therefore, I decided to do my research not only in the processing company but also in the collective system. It seemed even more necessary since I knew the powerful position of the collective systems in decisions made about the trajectories of e-waste and in the public presentation of this sphere. The ethnographic research that lies in long-term stay among the group of people represented then the most suitable method how to discover the practices that are usually kept hidden and silenced. These practices can hardly be detected only by interviews or questionnaires. To understand the human-material entanglements, they must be experienced through the body's engagement, as I discuss below in relation to Judith Okely (2007).

I spent five months working at EREDA in 2020 and one year as an intern at Gamma from August 2021 to August 2022. The key method I used as part of my ethnographic research was participant observation, which presupposes the researcher's involvement in the activities, interactions, customs, and habits of a group of people. Participant observation is essentially quite ordinary practice. As Musante (2015: 252) mentions: "All humans are participants and observers in all of their everyday interactions, but researchers engage in the systematic use of this information in formal analysis." The realisation that the researcher is not the only participating observer or observing participant contributes to the smoother integration of the researcher among the chosen group of people. Obviously, the difference between the researcher and group members can still be huge, and the integration of the researcher into the field is always somewhat incomplete. Still, the incompleteness provides a space for creative

negotiation of the differences and similarities and for setting up a relationship that searches for commonalities despite different backgrounds.

The method of participant observation necessarily requires keeping fieldnotes (Musante 2015: 274) "as 'factual evidence'" (Madden 2010: 118). Therefore, writing down fieldnotes represented a significant part of my research. I kept a field diary where I recorded my fieldnotes and other essential data about the companies, informants, and events I participated in. For these reasons, I used Microsoft OneNote, which allowed me to save data in the cloud and access it on my laptop and mobile phone. After an unpleasant experience when my backpack with two field diaries from my research for a diploma thesis was stolen in the autumn of 2019, I decided not to rely on a physical medium. The fieldnotes included daily observations, subjective experience and random short interviews. Along with keeping a field diary, I explored the news related to e-waste in the online mass media and environmental websites. The websites of the major compliance schemes and chosen e-waste processing companies also became an essential source of information.

The way the environment and the relations between human and non-human actors are experienced and known evolves along the personal characteristics of the researcher. As Paloma Gay y Blasco and Huon Wardle (2007: 141) note: "Ethnographic knowledge […] is always relational, the product of multiple cross-cutting conversations across diverse contexts, not only between anthropologist and informants but also between anthropologist and others in the academy and more broadly 'at home'. In this sense, we agree with James Clifford when he says that the activity of ethnography is always 'plural and beyond the control of any individual' (1983: 139)." The researcher's attitudes and values affect the relationality and plurality of ethnographic knowledge. Robbins describes it followingly: "In his classic essay on objectivity, one of Weber's key points is that, regardless of the position one takes on the possibility of separating empirical observations from value judgements in the course of social-scientific analysis, one has to acknowledge that the choices social scientists make about what to study in the first place, and the way they define clear objects of study out of the ever-shifting reality of social life, are always driven by the values they hold to be most important" (Robbins 2013: 447–48). I did not have any personal relation to the field of e-waste recycling when I decided to study it. However, I gradually approached it with, on the

one hand, a romantic interest in the salvaged and creatively used discarded things and, on the other hand, a suspicion of how the calculative logic of markets inscribes into environmental care and social responsibility for the people with disabilities.

The movie "Welcome to Sodom" and the meeting with Mrs Sobotková were my first encounters with the e-waste sphere; I could not have imagined these experiences being more different. Yet, they were still far away from how my research developed further. Thus, my entanglement with the e-waste material started wide. I was lucky and quite quickly persuaded the chief manager of an e-waste processing company, EREDA, to employ me for five months. I must admit it did not take that much convincing. During our interview in June 2020, the chief manager seemed to be intrigued by the fact that I was a social anthropologist who wanted to do research in his company. He expressed doubts about what I would do there for five months because he admittedly told me everything. He said EREDA was not a characteristic company and I should have visited another company. Although he still needed to ask his colleagues, I was leaving that day with the promise of a work position. One month later, we agreed on the date of starting work.

I was employed at EREDA, the e-waste processing facility in Moravia, the eastern part of Czechia, from August to December 2020. Ethnography "at home" usually assumes some extent of familiarity with the researched environment. Esther Anderson (2021: 3) describes these assumptions as "unrealistic and misleading." Her experience conducting ethnographic research in the location where she lived led her to find that "the inherent value in conducting ethnography at home is not simply in locating the potential for strangeness in familiar locations, but also in what can be learned about the ethnographic self." My departure to an unknown town and type of work was linked with mixed feelings of excitement and worries. Although I had already gained a little experience with disassembly work in Prague, I felt very uncertain about my bodily capacity to work manually in such a company in a similar way as Okely (2007: 65) depicts anthropologists' experience with the fundamentality of bodily involvement in the research that includes participation, thus physical engagement. The dominant cultural expectation would be that men rule the field of e-waste disassembly due to their strength and culturally given push to understand technical concerns. However, I met many capable women in e-waste processing. My fear that the men

would be rude and angry with my incompetence proved groundless. Instead, many of them showered me with regard and attention.

Soon after I was employed at EREDA, I realised that being technically incapable is not necessarily an obstacle in e-waste management. It even proved helpful, as my technical illiteracy especially encouraged men to explain everything and demonstrate their proficiency and familiarity with the company's order and running. Being new to the field makes asking about various unknown subjects more spontaneous and authentic. The way an ethnographer navigates the inquiry into a heterogeneous group of people is always necessarily individually shaped by the ethnographer's personality (Hammersley and Atkinson 2007: 73), ability to establish relations, communicate delicate topics, and willingness to cross boundaries. My research was significantly affected by the fact that I was a 29-year-old, open and friendly woman. Even though I was not aiming for that, I think some relationships I established with men were partially grounded in what I would call a latent attraction. I mean the physical or romantic attraction that might have contributed to the easier start of a friendship for some men. If they played a role there, these attractions remained verbally unarticulated in most cases. However, they manifested in different ways, such as the invitation for dinner or the outdoor swimming pool, undesirable physical contact, or attempts to set me up with a single relative.

There have been debates about the effect of gender on ethnographic research, particularly on the role of women fieldworkers (Hammersley and Atkinson 2007: 73). The discussion mostly concerned the limitations of one's access to the areas and certain knowing depending on gender (Bernard 2011: 280–81). This relates to the other topic that raises ethical questions in conducting ethnographic research: building sexual and romantic relationships between the researcher and research participants (Kulick and Willson 1995; Fine 1993: 283–85). Although I did not get involved with any research participant romantically or sexually, I found it challenging to navigate through the close relationships built in the fieldwork and not hurt anybody. These close relationships were affected by my personal characteristics related to age, sex, and gender, which, on the one hand, facilitated my entrance into the field and, on the other hand, created certain hopes and expectations from my research participants.

The sociologist Liz Grauerholz and her colleagues offer a helpful account of researchers' liability to yield attraction and get involved with the research participants sexually or romantically. They approach attraction as an active "emotional process experienced by an actor that might be manifested physically verbally, mentally, in any combination" (Grauerholz et al. 2013: 168). They list three reasons why intimacy necessarily accompanies ethnographic and other qualitative research, that are: proximity as "the strongest predictor in determining attraction and choice in sexual partners;" attraction is promoted by sharing values and interests that is a part of the field research; and the researcher get immersed in the research through engagement and intimacy (ibid.: 168). Being aware of these aspects, I tried to be reflective and sensitive and adapt my social conduct in a way that would not encourage any sexual interest.

Sensitivity is associated with intimacy and care. Ethnographic research is characterised by the method of participant observation, which is based on a long-term stay in the environment. In such a condition, the researcher inevitably deepens her intimate relationship with people and other non-human actors that are often distinguished by confidence, trust, and friendship. As Carolyn Fluehr-Lobban (2014: 146) mentions: "That intimacy is a powerful instrument that must be used with care so as not to violate the trust established nor abuse the confidence that has been given." It is precisely a profound knowledge of any phenomena that constitute a relation of care. The more one knows about something, the more one tends to relate to this object of knowledge. Ethnographic research lies in building a relationship that requires specific kinds of care. Such care meddles in how the research project is designed, in the research activity in the human and non-human environment, and consequently, in the analysis. Care as a part of the epistemological approach becomes evident in the individual steps of the research and leaves traces. Such care must also be oriented back to oneself (DeLuca and Maddox 2016: 296) since entering the new field as an insecure researcher keen to get access and gain any kind of help can be tough and complicated.

My position in both working environments, EREDA and Gamma, where my research took place, was privileged (or it was always perceived as such). Either I had more sources of income (except for that I received at EREDA) and therefore the necessary stability when I worked at EREDA, or I had different working conditions as an intern at Gamma, including the possibility of coming later or leaving earlier. A few

times, colleagues mentioned it as something to be envied, although I always mentioned that I had no wage for the work there. Apart from these long-term experiences, I have visited several collection yards that serve citizens to discard various waste. I also attended a few other e-waste processing companies. The following passages describe my first physical involvement with the e-waste materials. Further, I explain how I was involved in the activities of the collective system Gamma.

E-waste processing

In May 2020, I noticed old electronics, such as printers, keyboards, monitors, and other discarded electronics piling up in the hall of the Institute of Ethnology of the Czech Academy of Sciences in Prague. I talked with my colleague about it, and he suggested that as I am studying e-waste, I could provide the removal of this waste and use this opportunity to gather some preliminary data. I appreciated this idea and started to search for companies that collect e-waste in Prague. To my surprise, it was not an easy task to deal with. I had trouble finding the company that would provide the disposal. The first company I found was responsible for waste collection in particular neighbourhoods in Prague. I expected that this company did not have direct experience with the e-waste recycling processes. Therefore, I ruled them out. Then I was luckier, and I came across the company that was a sheltered workshop processing e-waste. I contacted the owner, Rostislav, who was willing to remove the discards from the Institute but was sceptical about my research. He objected that there was already a lot of research on e-waste in Czechia. When he informed me that one company researched the amount of fuel used in e-waste recycling, it became apparent that it was difficult for many outside but also inside anthropology and academia to imagine what it means to study waste anthropologically. Despite his suspiciousness, Rostislav was the first to guide me through his workshop, and when I asked him whether I could participate in the disassembly activities, he eventually agreed.

In the middle of July 2020, I stood under the hot roof in the semi-open shed (Figure 2) and, using the screwdriver first, and then, when it did not work, my strength, I disassembled the modems. Later in the afternoon, Rostislav transferred me to an enclosed workshop, which was located under the same roof and where the computers and mobile phones were disassembled. I was the only one who was working there from

9:30 to 16:30. The other workers, except for Rostislav and his colleague, were coming and leaving differently and seemingly randomly. All of them had health issues that entitled them to state support. During the day, I had the opportunity to talk to almost all of them. However, it was my last visit to this workshop for a long time. Soon after, I got an e-mail from EREDA that I could be employed with them for five months. However, my dubious research stayed in Rostislav's mind, and when I contacted him one year later, he was still willing to help me. Thanks to him, I could also explore the group of owners of scrapyards in the following year.

Figure 2 Rostislav's workshop

Collective system

My first meeting with Mr Urbánek occurred in the middle of August 2020 when I was recently employed at EREDA, and we worked on so-called batch tests. At that time, I did not know him, and based on his appearance, an older man with a chic flat cap, I thought that he was probably a foreigner with origin from Greece. Later, when the chief manager of EREDA explained to me the nature of batch tests, it became clear that

the mysterious Mr Urbánek was the director of the collective system called Gamma, who came to EREDA to observe the audit and batch tests of the operation of one of their key partners in e-waste recycling. Mr Novotný, the chief manager of EREDA, told me that EREDA had a very positive relationship with Gamma and Mr Urbánek and that he was the only director of the collective system who kept visiting EREDA. When I finished my part of the research at EREDA and said goodbye to Mr Novotný, he told me that he talked about me with Mr Urbánek and that I could contact him, and he would try to be helpful.

It was cold and gloomy February 2021 when I first went to the Gamma's office, where I met with Mr Urbánek. After the interview, I asked him whether there would be a position (volunteering) in their office so I could observe their daily working activities. He explained to me that due to coronavirus measurement and a lot of bureaucratic work associated with the new Act on End-of-Life Products, he could not imagine what I would be doing there. Instead, he suggested that I could accompany the externally working regional managers who provide the communication with municipalities. He also promised to provide me with a visit to one e-waste processing facility that concentrates on refrigerators and cooling appliances that are subjected to strict handling because they contain hazardous substances.

Due to the uncertain situation with the COVID-19 pandemic, the first time I accompanied an external advisor to the collection yards was only at the end of June 2021. In July, I was with the same advisor for the second time and mentioned that I would be happy to participate in more visits. I also said that I would like to address the director of competing collective system to make an interview with him. The advisor got a bit nervous, and in the end, he told me he would contact his leader to find out more. Based on my unforeseen requirements, I was invited to the Gamma's office to talk with the leader and Mr Urbánek. It showed that they, too, got nervous that I would go to the rival company. They were suspicious of me disclosing relatively secret information. I suggested that if they disagreed with it, I would not do it because I felt obliged to them. I also expressed an interest in becoming part of their team. I added that I could imagine working there as an intern without payment. The director was pleased and told the leader he could work for free, too. The leader of the advisors did not accept this teasing positively and turned the attention back to me. He suggested that I could help

with the new contracts. The director agreed, and the following week, my one-year internship and research in the collective system started.

From August 2021 to August 2022, I attended the Gamma's office two or three times a week. My task was straightforward – I had to scan the contracts between Gamma and municipalities and insert them into the information system to be visible to the corresponding municipality. Occasionally, I got different tasks, but the scanning was the most important one that took unexpectedly long to finish. Shortly after my start, I found out that the expectation was that I would be there for two months. I hoped I would be allowed to stay till the end of the year (it would mean four and a half months). Ultimately, I stayed till the next August because it became apparent that the provision of flawless contracts required multiple controls and constant communication with the municipalities. The work on new updated contracts was necessary as a new Act came into charge and required the collective system to apply again for permission and license. Both the new Act no. 542/2020 Sb. on end-of-life products (§ 65, par. 2a) and the previous Act no. 185/2001 Sb., on waste (§ 37k, par. 6a) specify that the producer of electronic and electrical appliances, the collective systems on their behalf, have to have a collection point in every municipality with over two thousand inhabitants. This obligation was easily achieved by a direct contract with the municipality and its collection yards, but it was not always feasible. The number of contracts with municipalities was vast, with around 1500 contracts. All of them had to be updated in compliance with the new Act.

While scanning and inputting the data in the information system, I had many opportunities to communicate with other employees of the collective system. Many of the interviews concerned common topics such as family life, cooking and recipes, plans for weekends, hobbies, and similar. Less often, we discussed the work conditions, satisfaction with work, problems within the company, and complicated relations with partners, including municipalities, hauliers and recyclers informally. Due to the length of my internship at the company, I was able to create close relationships with most of the employees. At the end of my stay in the company, the director tried to persuade me to work for their company even longer. Since I had also established an amicable relationship with him, I considered it a nice offer.

The chapters

The following text is divided into five chapters. Each chapter introduces a part of my research environment and examines the aspects of human-material entanglement and the effects of calculative logic in more detail. I start with the most visible aspect—the fact that this sector employs people with disabilities—and gradually disclose the rather invisible aspects of sorting practices, responsibility, and work. I devote the first three chapters to my ethnographic experience from the e-waste processing companies, mainly from EREDA, where I spent most of my time. The following two chapters then capture the circumstances regarding the collective systems and the insight I got thanks to the internship at Gamma.

The first chapter, titled *Disability and Waste,* builds upon the fact that approximately one-tenth of e-waste processing companies in Czechia employ more than 50 per cent of people with disabilities. The disassembly of e-waste, however, represents demanding work in difficult working conditions. Keeping this in mind, it raises the question: Why do people with disabilities work in the e-waste recycling sector? I focus on what defines their work and how we can understand the concept of waste and disability when they are put together. I consider the terms waste and disability very similar. Both are quite broad in what they refer to. Both are considered to be a risk to the order. Both might be only temporary in the life of a human or a thing, and both are socially produced categories. Following the redemptive politics of recovery of Patrick O'Hare (2023), I look at how people and things are revalued in mutual influence.

People with disabilities generally have fewer chances to get employed, especially when they live in rural areas. I analyse the waste disassembly work done by people with disabilities and deal with the consequences of the invisibility of disabilities. I pursue their everyday realities at work and show how the aspiration for sameness produces a bad temper among the workers who assess the working outcomes among them. When scaling up, I recognise the mutual dependencies between people with disabilities and e-waste due to the state funding of companies in the sheltered job market. Finally, I emphasise that the significant role in achieving economic efficiency plays not only the calculative logic behind e-waste processors' decision-making but also the calculative practices of people with disabilities regarding the provision of state support. Thus, people with disabilities may contribute to the profit of companies

involved in e-waste treatment whilst applying many abilities that provide them with a good life.

In the second chapter, *Classification freedom*, I disentangle the contrast between a strict working regime and what I call classification freedom. Classification freedom refers to the variety of decisions and practices regarding discarded electronics or their disassembled parts. I argue that this freedom is allowed by the stabilising forces in which the e-waste processing company is embedded. E-waste recycling in Czechia is entangled in specific registers of value with environmental, political, social and economic orientations. These orientations establish steady grounds with stabilising effect for the company and its workers, thus creating space for free deliberation over classificatory practices. Besides, classification freedom is linked with the ways of knowing and the values related to the imaginaries of e-waste. I discern the moral value lying in the effort to take a responsible and conscious approach to waste and the sentimental value constituting the circumstances for everyday action. This chapter examines the dynamic between change and stability in the e-waste working environment. This dynamic is promoted by the human-material entanglements that allow people and things to reassess their value.

Classification freedom involves the cases when the worker decides to sort a disassembled part of electronics out differently according to the state of laziness, the willingness to enrich the buyers of that material, the lack of knowledge, the effort to increase the profit of the company, or the worry about one's health. Simultaneously, it concerns the state of electronics before it becomes disassembled. The workers tended to examine the appliances and devices already when they put them on their working table. When it proved functional, they decided to use it further, either in the company or at home. I further deal with this practice of free classification in the following chapter.

The third chapter, *The Morality of Stealing*, pursues the examination of the electronics that was accompanied by the decision about its use. When the appliance appeared functional, the workers did not hesitate to steal it. In the third chapter, I elucidate why the workers decided to steal e-waste. This question has two levels in which it becomes attractive. The first is the consideration of stealing things from the company when stealing is commonly perceived as socially, morally, and ethically unacceptable. The second lies in the fact that the object of stealing is something rather

unwanted. In this chapter, I build upon Zigon's thinking about moral breakdown as the moment when the moral and ethical aspects of an individual's life are reflected. I suggest that an individual is forced to assess their behaviour in everyday activities in relation to the previously accepted moral and ethical standards.

I demonstrate this in the daily negotiations of EREDA workers when considering stealing things. They searched for ways to justify their action and used the taken things to give them further to other co-workers, to anybody outside the company, or to share them within the workshop. Gift-giving becomes the way to resist the alienation of the products of one's work and simultaneously how to decide freely. Sharing also contributes to prolonging the life of the thing, although not recognised by the proponents of circular economy as an efficient way of treating the resources. This chapter argues for the irresponsibility and immorality of the consumer lifestyle and capitalist market, leading to extensive waste creation. In the e-waste processing companies, stealing becomes a moral and ethical action that contributes to prolonging the lives of the things and promoting the value of the object and the social value of their relations through practices of gift-giving and sharing. It also highlights the specific ways of developing human and material entanglement through negotiated moral beliefs.

The fourth chapter, *Cutting Responsibilities,* leaves the environment of EREDA to pursue collective systems as important stakeholders in e-waste management in Czechia. It elucidates the nature of its operation and focuses on division and the limits of its responsibilities as they fulfil the extended responsibility of the producers (EPR). Commonly, the responsibility for waste is attributed to individuals as part of the neoliberal responsibilisation. Drawing upon the critique of Susanna Trnka and Catherine Trundle (2017a), who suggest three forms of responsibilities that compete with neoliberal responsibilitisation, or rather coexist, I see more types of responsibilities that become significant in the context of e-waste management. Using the example of people who died in the containers for e-waste when trying to get in, I illustrate the ambiguity of the division of responsibilities and the necessity to set limits. I build upon Marilyn Strathern (1996) and examine how these responsibilities are cut. I argue that the cutting occurs in two directions: in temporality and ways of knowing. These are other ways of human entanglement with materials.

The responsibilities are most often and most conveniently expressed numerically. In the fifth chapter, *The Heaviness of the Kilo*, I look at the numbers as characterised by their lightness and flexibility in contrast to the heavy realities that led to their emergence. I am concerned with the incompleteness that refers to the state of appliances that miss some of their parts. This phenomenon is essential for the collective systems, hauliers, and recyclers because it means they lose the potential value when the valuable component is absent or transport less weight, determining their remuneration. Incompleteness also makes numbers questionable. Focusing on the creation of numbers, I elucidate the hard work that accompanies such a process and lies in lifting the heavy appliances, undergoing the stress related to the control mechanisms and systems of measurement, and contending with the tricky measuring tools. These heavy realities allow for the emergence of a light and flexible number. In this case, the humans try to avoid their entanglement with materials by sticking to numbers when, however, materials bite back.

1. Disability and waste

The sun shining through the slats illuminated the swirling dust in the workshop. The noise of the cordless screwdriver, accompanied by the sounds of banging and beating, filled the room. Televisions and monitors were losing their original shape. This electronic waste vanished in workers' hands and was replaced by smaller pieces of plastics, iron, printed circuit boards and fluorescent lamps (CCFL). "The upper workshop" of the e-waste processing company, EREDA, was running in its usual rhythm. Almost twenty disassembly workers of the sheltered workshop minded their own business. Being one of them, I took one monitor from the crate that Eva and Nikola brought from the hall downstairs in the morning. When I put it down on my table, I noticed a piece of paper that the previous user of the monitor had probably taped to the stand. The paper said: "Even the lowest work can be a work for God."[12] (Figure 3) Since waste work is commonly stigmatised, I considered it adjacent to the situation. It sounded like those motivational quotes that were supposed to boost our morale and encourage us to think positively about ourselves.

Figure 3 "Even the lowest work can be a work for God."

[12] "*I nejnižší práce může být prací pro Boha. sv. Marcel*"

Only a few days earlier, I entered this workshop for the first time as a new employee and obtained my first impressions of this work. That day, the foreman, Gabriel, took me into his office to give me a pair of gloves. When he looked for the right size, he told me EREDA was a sheltered workshop. He said that they had many workers, and most of them were people with disabilities. Then, he added that some of them had mild intellectual disability. When he finished, he quickly emphasised that all of them were nice. I found it interesting that he felt the need to highlight it. The workers I met during the first day did not evince the attributes that I associated with the disabilities. I could not see their different bodily dispositions. I started to work at the sorting line, where the workers took the pieces of various materials from the conveyor belt and sorted them. The work at the sorting line proved to be quite demanding because we had to stand the whole time and track the pieces of crushed appliances running in front of us. Although I was young, thanks to my scoliosis, I felt the effects of this physical work every evening.

In Czechia, approximately one-tenth of all e-waste processing companies employ more than 50% of people with disabilities. Such companies are colloquially called *chráněná dílna* (a sheltered workshop), although this term does not exist in law anymore. The managers at EREDA called the employees *chráněnci* (protéges). Both words have the same root and come from the word *chránit*—to protect. Disassembly of e-waste requires less qualification and less exactness than assembly of most types of new products. The dismantling creates an excellent employment opportunity for people with disabilities, as the workload can be less, and they can be "protected" in the job market. However, e-waste recycling work was characterized by various demanding and challenging aspects, such as lifting heavy objects, increased noise and dust exposure, and handling toxic materials. As Jacob Doherty and Kate Brown (2019: 9) mention: "Waste work is painful and precarious. It wastes workers' bodies and lives." The fact that such space provides working opportunities for people who suffer from various physical or mental issues and who are often socially excluded led me to the following question: Why do people with disabilities work in the e-waste recycling sector?

The waste work is mostly linked with informality (Alexander and Reno 2012b: 19), precarity, health risks, wagelessness (Millar 2018), and invisibility (Nagle 2013). Doherty and Brown (2019: 10) also bring attention to the specific context of capitalist

production when waste work becomes formalized, visible, and rather volunteered than waged. As Reno notes, the emergence of sanitary landfills was accompanied by "establishing the profession of waste work as a clean alternative to rag-and-bone pickers, junk dealers and others who became identified with waste management during the previous century" (Reno 2009: 39). This profession becomes wage labour, but it remains to be invisible. Most ethnographies on waste work address the informal ways of labour in the case of waste pickers and scavengers. Specifically in association with e-waste, the research is often focused on small-scale workshops in which capital accumulation is obtained directly by owners or workers who actively participate in the processes of valuations (Sanchez 2020; Corwin 2018; Gregson et al. 2010). The other type of waste work related to e-waste recycling is described by Laser (2020), who presents the high-tech industry where most of the work is done by machines. In all this research, except Laser's, the people's intimate relationship with waste is linked with the specific knowing of waste (Alexander and O'Hare 2023; Butt 2023) and with the experience of its transformation (Sanchez 2020). I assume that this is strengthened by the capacity to decide the fate of the waste objects. People with disabilities working in sheltered workshops didn't have this kind of power. More often, these companies, although participating in the sheltered job markets, represented self-sufficient actors in the global market where the workers are alienated from the products of their work in Marx's sense through wage labour (Harvey and Krohn-Hansen 2018: 14).

In my field of disassembly of discarded electronics, people with disabilities come across one type of waste: e-waste. The definition of the two concepts—waste and disability— is challenging. In this chapter, I want to examine particularly what disability means in the context of waste work and what aspects of the link to waste material become significant. Although I refer to people with disabilities, during my research, I encountered waste workers who were vulnerable in the broader sense. In the other recycling companies I had visited, I met except for people with mental or physical disabilities, workers with psychological illnesses and prisoners. All these people have only limited options of being employed or occupied due to their health issues or their execution of the sentence. Still, I mainly focus on those who are described as people with disabilities.

Critical disability studies suggest understanding disability as in contrast to a "normal" body. Disability is then perceived as a relational and social category ideologically discriminating against those who do not conform to the constructs of "normality" (Ginsburg and Rapp 2013: 54). Lennard J. Davis (1995: 24) examines the construction of normalcy,[13] which he considers more relevant and problematic than studying the construction of disability. The label of disability denotes a broad scale of various bodies and intellects that is not homogeneous (Kolářová 2012a: 18). At the same time, it is presented as an absolute category: "One is either disabled or not" (Davis 1995: 1). As Davis (ibid.) describes, most temporarily abled people tend to associate disability "with a visible physical impairment […] or with a sensory or mental impairment." Unlike this common assumption, the disability "is part of a historically constructed discourse, an ideology of thinking about the body under certain historical circumstances. Disability is not an object – a woman with a cane – but a social process that intimately involves everyone who has a body and lives in the world of the senses" (ibid.: 2). Similarly, Tom Shakespeare (1998) refers to "the social model of disability." Rosemarie Garland-Thomas (2002) approaches the category of disability as a symbolic system that promoted the emergence of power inequalities. The inequalities become significant through the practices of classification that put disabled bodies out of social and cultural order they could disturb (Kolářová 2012a: 21). The bodies do not become disabled only at the moment of birth. Instead, "[d]isabilities are acquired by living in the world, but also by working in factories, driving insufficiently safe cars, living in toxic environments or high-crime areas" (Davis 1995: 8). The intangibility and ambiguity in defining disability is close to how waste is conceptualized.

Waste represents a category that eludes a simple definition. Zsuzsa Gille (2010: 18) states, "materials are not 'born' to be waste: they are transformed into waste by identifiable material and social processes." The emphasis on the process through which waste appears is ubiquitous in the works of waste studies scholars. "The activities from which waste emerges" (ibid.) are as important as imaginaries and activities in which waste "expires" (the object gains a new function). These activities and imaginaries may be understood as value-productive. As Reno (2009: 30) mentions: "If value derives

[13] More about the role of constructing and imagining ab/normalcy and otherness in Filip Herza's book titled *Imaginace jinakosti* (Imagination of Otherness) (Herza 2020).

from the action invested in something, relative to the actions that go into doing other things, then discard would seem the prototypical objectification of negative value, things that are not worth (or 'waste') our time and creative capacities (Munn 1986: 215–33; Graeber 2001: 83–84)." The EREDA workers do not consider the appliances to be waste with zero value. Instead, they speak of the dirt or non-functionality of the appliances and approach them as having the potential to be functional and worth spending time on. It allows them not to think of their activities as wasted.

Reno (2014: 4) notes, "'waste' is typically assumed to be something unwanted and discarded, the opposite and symbolic counterpart of a valued treasure." The assumption that waste is in opposition to value is challenged by Alexander and Sanchez (2019b), who bring up the notion of indeterminacy. They see waste and value as "co-constitutive" (Alexander and Sanchez 2019b: 2), and indeterminacy then presents the third modality. It denotes everything that evades classification. „[T]he condition of indeterminacy can be seen as a mode between, or as encompassing, waste and value" (2019b: 17). Unlike value, "wastes can be indeterminate in the sense of a forgotten or postponed limbo, unattached in terms of property rights" (ibid.). Both value and waste contain the potential for the other to be valued or wasted. Thus, the relation between waste and value should be approached as complex and not definite.

In this chapter, I look at what the connection between the categories of disability and waste implies and investigate how the actors involved in e-waste recycling (e-waste processing companies' owners, supervisors, collective systems, and state) use the ambiguities of the first category. I argue that the terms waste and disability are related in the broadness of what they refer to: they represent socially produced categories; they can form only a temporary reality in the life of a thing or human; they both refer to a broad scale of meaning that allows for multiple interpretations; and they both assume a risk to the order. Both are also inherently connected when, in the effort to reconstruct the sameness in capitalist everyday life, there is a need to discard everything potentially disturbing to defy "all signs of transience" that might remind us of the consequences of our actions and the biological processes of our bodies (Reno 2016: 25). I engage with the concept of waste in more detail in the two following chapters where I elaborate on many of its forms. Here, I refer to e-waste primarily as a homogeneous material.

Inspired by James Scott (1998) and his emphasis on the states' strategies to include processes of standardisation, simplification, codification, abstraction, and the valorisation of procedures deemed to be scientific, I approach these two categories as insufficient to describe the living realities linked to local knowledge. I notice moments when disability becomes more significant or stays in the background in the daily relations of workers in various environments where e-waste is treated. Further, I focus on the multilayeredness of disability and bring attention to less visible aspects of disability that emerge as important, such as the state subsidy. I examine how e-waste materials when entangled with people with disabilities, might help reflect the moral and ethical principles on which the capitalist society stands.

In the following sections, I elaborate on the characteristics of waste work done by people with disabilities. The first section explores the working environment of the e-waste processing company, EREDA, and deals with the effects the invisibility of disability has in various spheres. The impossibility of seeing some of the health problems leads to pressure on work performance and bad tempers among workers. The following section depicts slightly different working environments where the potential of e-waste is used mainly to help people. I build upon Patrick O'Hare (2023) and his elaboration of the redemptive politics of recovery to look at the mutual appreciation of people and things as emerging in their entanglement. I show how fragile the line between recovery and extraction is. The last two sections describe the mutual dependencies between categories of waste and disability. First, on the case of the dependence of people with disabilities on the e-waste disassembly work, I show how, through the work with waste, people resist the label of human waste and exclusion from work society. Second, I look at how waste work depends on the people vulnerable in the job market due to their health issues. I examine what kind of dependencies appear meaningful in the employment of workers for e-waste recycling.

Invisible disabilities

In the grumbling of the running conveyor belt, Markéta, a fifty-year-old woman who was behaving somewhat hastily and absent-mindedly, told me and other workers about her childhood. When she was in the first class of primary school, she was diagnosed with leukaemia. She had many absences from school but managed to finish vocational

school. However, the radiation treatment she had to go through left her with consequences. Several years after treatment, the tumour developed and pressed the brain. She explained to us that the pressure caused her to faint often. A few minutes later, Markéta talked with Michal about the work in the "upper" workshop where the very stereotypical process of connecting small wires for a German company was carried on. Michal, a forty-year-old man who was the boss at the sorting line, described that they told him he should manage to create 1500 to 2000 wire bundles during the eight-hour shift. However, the worker there, Anička, made only 500 bundles. Michal then asked the supervisor why he had to fulfil some quantity when she did not have to. The supervisor replied: "*No jo no, vždyť to je Anička* (Well, it is Anička)." Markéta got angry that there was made a difference between those who "*mají papír na hlavu* (have a paper on the head)" (psychological illness) and those who had some physical impairment. When she worked there, she made 900 bundles, and they asked her why she made so little. She explained it was the first time she made it. However, she highlighted that the low work performance was not accepted in her case.

People working with me at EREDA were mostly after accidents and medical treatments. The heterogeneity of disabled bodies involved injured backs, damaged knees, sore shoulders, swelling fingers, poor sight, mental disorders and other illnesses. Most of their health problems were invisible and obscure without prolonged observation or being uttered. The invisibility of the disability had various consequences, including pressure on work performance and bad tempers among workers. As Kolářová (2012a: 19), following Tom Shakespeare (2006), emphasises, the category of disability should be understood as a specific type of social labelling rather than being related to the individual body. As such, this category increased or decreased in importance depending on the context. In other words, its significance unfolds based on the relations in the assemblages. In the daily encounters with disability at EREDA, disability has become the overlooked characterisation of the workers. It was highlighted only in some specific moments and situations. I suggest seeing this problem not only as the consequence of the invisibility of health problems but also as linked to the insufficient category of disability. This insufficiency lies in the idea of the sameness characterised by a specific aspect based on an individual's concrete experience and knowing.

As a sheltered workshop, EREDA employed people who were officially by the state denoted as OZP – *osoby se zdravotním postižením* (people with health disabilities). The person becomes OZP when it proves her condition to the Czech Social Security Administration. In this case, the disability is understood as an obstacle to the full-fledged performance of work activities. Kristýna Kolářová (2012b: 47–48) elaborates on the use of terminology associated with people with disabilities in the Czech context. The word *postižení* does not directly refer to the lack of ability. Instead, it relates to something terrible that affects or strikes the person. Kolářová points out that *postižení* is also part of the definition of normality when it is defined as an obstacle that prevents the person from "adapting effectively to the ordinary demands of life" (Hartl and Hartlová 2009, cited by Kolářová 2012b: 48). This phrase according to Kolářová conceals "a reference to the disciplinary demands of the 'normality' and 'everyday life' of modern society." (Kolářová 2012b: 48) The term disability is also subjected to criticism from critical disability studies. Similarly, I observe that what is troubling in the context of an e-waste processing company is not any lack of abilities but the imaginaries of what is "normal".

The nature of the body contributed to its approach to work, and in many cases, it determined what kind of work the body was assigned to. For example, Anička, who was slow and had trouble with her back, worked on the stereotypical task. However, although Markéta indicated certain inequalities made by the supervisors concerning people with physical impairment, there seemed to be other criteria in assigning the position. Later, when I was working in the "upper workshop", the women there told me that Markéta formerly worked there with them. Žaneta and Staňka described that she just talked with her colleague and did not work. She also did not cooperate with others. Due to her low work commitment and the fact that she created a bad working atmosphere, she was sent to the sorting line. These qualities are considered as important as the health condition from the perspective of the supervisor and the foreman.

This situation mentioned above depicts the broad scale of people's health problems. At the same time, it highlights that it did not represent the only feature that would have decided about the job objectives. Except for disabilities, the supervisors paid attention to the attitude of workers. The disability identity was partial, and although it was significant in the sheltered workshop, it did not prevent other personal traits from

playing an important role, too. The individual behaviour was monitored by supervisors and also the workers in order to control the work performance. The motivation was, however, different for each of them. Whilst the supervisors wanted to make sure the work would have been done, the workers measured whether each of them was awarded for the same amount of work, as I show in the situation from the sorting line at EREDA.

When we purified copper scrolls, each worker collected the pure copper in their plastic crate (Figure 4). At the end of the shift, we together poured the copper into one funnel under which the container was located. When taking one crate after the other, it was visible how much each of us worked. Honza, the twenty-year-old boy, had considerably less copper than the other workers. When I noticed that, I picked at him. I

Figure 4 Copper scrolls at the sorting line.

found it comical that he talked a lot and worked little. At the same time, he kept emphasising how he wanted a hardworking girlfriend. However, Petra, a shorter fifty-year-old woman, did not approach it with the same amusement as me. She complained that we worked hard, and Honza got it for free. Jarda, another twenty-year-old worker, commented that everyone worked at their own pace. Petra added that the problem was that Honza admired another woman worker and talked with her. Therefore, he did not work enough. I thought that this was not the problem. Honza was generally inattentive. Moreover, he told me earlier that he did not want to overstretch and feel sick. He preferred to work softly. Still, whenever somebody asked him to do something, he was ready to help.

At the sorting line, we worked as a small community. Honza and Jarda were two of three young boys around twenty years old from twelve workers. They did not like it when other workers, especially three fifty- to sixty-year-old women, and Michal, the forty-year-old boss, gave them pieces of advice on how to behave and lead their lives. I believe part of this resentment encouraged Jarda to be open to different work outcomes among the workers. Petra's requirement for sameness emerged from the long-lasting efforts of states to build the imaginary of the same citizens. Here, I draw upon what James Scott (1998: 2) characterises as the legibility of society. He describes it as a condition that allows for large-scale social engineering. Although I refer to different contexts, disability becomes one way of simplification that makes society legible and manipulable. At the same time, the fact that most of the disabilities were not visible at first sight and thus did not have to be consciously perceived in day-to-day interactions meant that the workers were perceived nearly as abled ones.

During the disassembly, I usually talked with Emanuel, who sat next to me. One autumn morning, after Staňka distributed a box of chocolates one worker gave us as he celebrated his birthday, Emanual recalled that the work used to be cooler under the previous foreman. It used to be common to go to the locker room and chat there with other workers. The previous supervisor also used to come and talk with another worker for half an hour. Moreover, the supervisor did not care about them because the previous foreman was in charge (now the supervisor also monitors the workers' working activity). I asked Emanuel when it changed. He told me that it was two years ago. He was upstairs in the locker room during the break, and when he slowly came downstairs

at the end of the break, he started to eat an apple. The foreman Gabriel complained about him, and therefore Emanuel received "Liebesbrief"[14], as he called it, from the chief manager. Emanuel added: "The previous foreman knew what we were doing, that we are a sheltered workshop, and that the economy does not depend on us. Whereas Gabriel came from the forest,[15] and it started to run." Emanuel commented further on the cameras that were placed around the EREDA premises, including in the upper workshop. "They are illegal, but the company would claim they are for guarding the compound, although they use them to observe. It is like a prison here." Further, Emanuel noted that there were always so many televisions to disassemble that it is not because of the increase of e-waste that the nature of the work has changed.

Emanuel's scolding on the changing conditions in the company was not unique. Similarly, once, when I went with Žaneta and Staňka to the canteen to have lunch, they talked about the fact that the work here was less stressful and more tranquil in the past times. Žaneta told me that she had asthma. She was not the only one. Almost all my colleagues had some health issues. However, as Žaneta and Staňka claimed, nobody considered the health problems. Romana, the "pevná" woman in her fifties working next to me, complained to me that the supervisors want the same from the disabled people as from the abled ones. Moreover, the change of the foreman was accompanied by the pressure on the higher work performance. This led to increased tension among workers, as the following situation shows.

It caught me off guard in the morning when I heard Tibor from the other side of the workshop raising his voice. He spoke to a new employee and asked why he unscrewed the metal sheets when they were the same material. Then Tibor raised his voice even more, and indignation could be heard in his voice. He asked a new employee: "Why did you not ask when you didn't know something?" I was not the only one taken aback. Božena, who worked close to me, noted: "Tibor is back on fire!" He just angrily told her to mind her own business. After a while, he came to me to ask me how it was going. I told him he should not get angry so easily because the new employee was young and did not know much yet. Tibor told me that a new employee

[14] "Liebesbrief" is a German word for love letter. In colloquial Czech, it is used either in its literal meaning or with a touch of irony, as in Emanuel's use.
[15] Before EREDA, Gabriel worked in forestry. The way, how Emanuel formulated this fact, however, refers also to his despise of foreman's leadership.

had been here for three weeks already, so that he could have known it. Then he continued that last week, the supervisor shouted at him that he did not have a performance. He noted that he did not want to work for two and hastily left. EREDA workers struggle with various health issues that differ in their specificity. This variety had an impact on work performance and individual behaviour. Most of the health problems or disabilities people suffered from were invisible, and therefore, in their daily interactions, others did not consider them. It led to situations where the workers were under pressure on work performance despite their health issues or when the co-workers expected the same working outcomes as they could achieve. The pressure on work performance stems from the public discourse of morality that emphasises performance and efficiency in various aspects of one's life. The unifying category of disability led to the assumption of homogeneity and sameness. The reality at the workshop, however, proved to be different.

Optimal activity

The first e-waste recycler I visited at the beginning of my research was a small company with approximately eight workers. The company's owner, Rostislav, was a good-hearted man with a roguish smile that raised suspicion about some ulterior motives. He employed people with serious mental issues. These people usually had a very free working regime. Once, Rostislav offered me to join him in visiting the psychiatric hospital. He explained that he started cooperating with one of the employees who guaranteed the activities for patients there. Rostislav supplied some electronic parts to the workshop so the patients could spend their time with a simple disassembly. When Rostislav introduced me to Mr Led, who looked after the woodcarving workshop that included electronics disassembly, we agreed that I would come again to participate in the activities of the workshop.

The following week, I came to Mr Led's workshop to help him as an assistant. When I arrived, Mr Led explained to me briefly how the workshop worked. The patients could come there during the morning and afternoon shifts designated for therapeutic activities. He was showing me the various tools in the workshop when a man came in. I recognised him from Rostislav's workshop, where I met him almost one year ago. He looked angry. A moment later, two other men appeared. One of them,

who walked on crutches, tried to explain to the angry one that it was meant within the context when he called him "a weirdo". He added that all of them are "weirdos". Later, I talked to this guy with thick, grizzled hair and a cheerful expression. He introduced himself under the nickname Vlásek. When we talked, he was separating the metal parts from the small, printed circuit boards. He told me that he had been in the hospital for two months now. Before that, he spent nine years in prison for child pornography and sexual assault. When he was a child at the age of 12, he had been raped for three years. Therefore, he did not understand that he had done something terrible, as he had described to me. When he was leaving, I asked him why he chose this activity. He replied that it was the optimal activity for him because he could not work standing due to his hips. E-waste disassembly allowed him to sit and work only with his hands.

This case shows that e-waste found its way to places where one would not expect it to be. In policy papers[16] and documentary movies,[17] e-waste recycling is commonly depicted as part of the informal activities in the countries of the Global South. In Czechia, another familiar image of discarded electronics is linked with the scrapyards that are interested only in materials with financial value. All these resources, including scholarly literature on e-waste, did not indicate that e-waste might have been found at the place where people recover from various types of psychological illnesses.

The e-waste disassembly in the psychiatric hospital becomes a specific type of labour. From the perspectives of workers—patients, the disassembly represents an "optimal activity" that complies with their physical capabilities. It also offers other more or less exciting and meaningful option for fulfilling their obligation of therapeutic activities. This type of work has no requirements on time or performance but does not provide any financial income. Instead, together with other activities offered in the therapeutic centre, it provides recognition in the form of points that are necessary for the smooth passage of the therapeutic programme. The restorative work on recycling was excluded from the capitalist relations until the outcomes were handed over to Rostislav.

Although patients' work was not wage labour, the outcomes of their work were further capitalised when Rostislav sold the sorted materials. Instead of financial

[16] Press releases from Basel Action Network: https://www.ban.org/trash-transparency
[17] Welcome to Sodom, Direrected by Florian Weigensamer, Christian Krönes. Switzerland/Germany/Austria, 2018. 92 mins.; The E-Waste Tragedy, Directed by Cosima Dannoritzer. Spain/France, 2014. 86 mins.

settlement, he paid for the disassembly in kind because he could not officially pay for the labour of the patients. As Mr Led told me, Rostislav provided the workshop with various tools such as cordless screwdrivers or a set of screwdrivers. At the time of my visits there, Rostislav and Mr Led worked on preparing the proper workshop. They reconstructed unused space within the premises of the psychiatric hospital where the more specialised workshop on e-waste disassembly could be created. Except for finding space and finances for adjustment of the space, the bureaucratic process of gaining all necessary permissions constituted a challenge.

Until I met Mr Led, I assumed that Rostislav's intentions in his entrepreneurship were primarily driven by self-interest. He owned the company that purchased discarded electronics from individuals and companies, assessed their functionality, and then disassembled, repaired, or refurbished them for resale. He had one colleague who helped him the most with all the trade, repair, and disassembly. Other employees, all with health disabilities, worked part-time. Except for monitoring the time spent, their work performance was not addressed. During one of my visits to the psychiatric hospital, I found out that it was not a coincidence or lack of Rostislav's care. Instead, there were social reasons behind it, as Mr Led implied. He informed me that Rostislav helped him a lot. The hospital did not have much finances, and it was still ruled by "a communist regime", as Mr Led called it. On the one hand, he praised it because it gave him freedom. On the other hand, there were only limited possibilities for developing the workshop and offering therapeutic activities for the patients. Further, he disclosed to me that Rostislav had a daughter with a health disability and that he was doing a lot for those people. He employed people who had psychological issues and searched for ways to provide meaningful activity for the patients at the psychiatric hospital. Mr Led appreciated Rostislav's generosity and kindness.

The activity of e-waste disassembly could contribute to the recovery of those patients. Moreover, it could give them a feeling that they do something meaningful. I build upon Patrick O'Hare (2023), who describes the example of the recycling cooperative in Greater Buenos Aires that fits into the national discourses of recovery. Recovery became a part of the post-neoliberal reaction to the consequences of neoliberal policies. In a recycling cooperative, the materials should be recovered and prevented from ending up in landfills, and the people should be recovered from

homelessness and drug addictions. O'Hare refers here to the waste politics of synecdoche when the part is taken to represent the whole. He argues that the post-neoliberal discourse builds upon positing the neoliberal system as wasteful, which allows for imagining the present and future in terms of recovery. However, such discourse leads to the temporal displacement of workers at the recycling cooperative, who are "'unknown' in the present by being presented as waste in the past and ultimately recoverable in the future. All this suggests that a more nuanced critique is required of the practice of representing people as discarded or trash-like" (O'Hare 2023: 528).

O'Hare further mentions that the redemptive politics of recovery is ubiquitous in Latin America. Similarly, Alexander and Reno refer to this politics and indicate that the aspects of Protestant redemption penetrate the sphere of recycling and relate to both, materials and workers. They state: "Materials are salvaged, saved, recovered; sorting through trash is a common rehabilitative exercise for prisoners, intended to restore them to being social citizens. Conversion applies equally to the materials […] and to saved souls" (Alexander and Reno 2012b: 26). In the less evident form, the fate of things and people is mingled in the motto displayed on the website of one e-waste processing company:

We buy and recycle electrical waste.
We employ people with disabilities.
We give a new chance.

This motto implies the analogy between waste and people, specifically e-waste and those defined by disabilities. "A new chance" is best understood as the process of revaluation. The scholars conducting research with people working in waste services pointed out that the waste is being made invisible, same as people who work with it (Sosna and Brunclíková 2015: 8; Nagle 2013: 17). However, that is not the case with the workers here. People with disabilities dismantling e-waste are not made invisible. Oppositely, the spotlight is on them to show the company's social responsibility. In the process of making them visible, they are put into relation to electronics. Both gain "a new chance."

In the case of the psychiatric hospital and Rostislav's company, e-waste becomes a material that has the potential to help. As a material that needs care or work

that can be adjusted to the possibilities of workers, it serves as a meaningful way to get occupied. Together with other means, it is used as a therapeutic tool. Further, it also becomes a tool that should guarantee the maximisation of the person's potential. Through focusing on the work of disassembly, the patients are supposed to train work habits and to orient their attention to manual entanglement with material and, through this connection, find their own value. In this case, restoring or recovering means improving one's integration into work society to make her a "normal" person.

Dependence on waste

In 2013, the public television broadcaster Czech Television published the article: "The sheltered workshop must be laying off" (Česká televise 2013). The lead paragraph further stated: "The sheltered workshop *Šance pro region* in Petrovice in Karviná District[18] is drowning in trouble and will be laying off. It is running out of e-waste, which it has already disassembled for several years. The sheltered workshop obtained e-waste from [a collective system]. However, the company terminated their contract. *Šance pro region* employs thirty-three people with disabilities. They are now worried about their jobs." The public media criticised, among others, the immorality of this behaviour (ČAOH 2014) as the reasons for terminating the contract seemed to be economic. In 2009, this collective system founded its own e-waste processing company and started to hand over most of its e-waste to it. Still, the annual reports of this company from 2007 to 2015 stated that the collective system cooperated with sheltered workshops each year. Interestingly, their number decreased from 14 (almost half of all contracted recyclers) in 2007 to eight in 2015. It was emphasised how economically inefficient this e-waste treatment is.

The collective systems that provide the collection of discarded electrical and electronic equipment can decide with whom to make contracts for e-waste processing. The contract sets the amount of e-waste guaranteed for the recycler. The collective systems generally tended to cooperate and support the sheltered workshops that provided manual disassembly instead of mechanical. In the case mentioned above, the problem appeared when the collective system suddenly refused to give a certain amount of e-waste to one sheltered workshop, although it had guaranteed a regular supply of e-

[18] It is a district in the Moravian-Silesian Region of the Czech Republic.

waste over the previous years. This unexpected turn was liquidating for the sheltered workshop that was dependent on the input of e-waste from that collective system.

It is puzzling to observe that the waste materials the world's governments try to reduce in an effort to create a greener planet or a planet suitable for living raise the longing for having more (Alexander 2016). The people who are vulnerable in the job market enter this perverse network as the dependent agents. The relatively simple disassembly work allows them to be professionally active. The economically driven decisions by the collective system then face deeper moral questioning. In the pursuit of positive financial results, the collective system places people with disabilities at risk of often losing the only chance of having decent work and thus becoming a valuable part of society. This conceptualisation is informed by the general acceptance of work that constituted full members of the "work society" (Carmody 2022)[19].

The decisions of the collective system represent the threat to people with disabilities of losing their important role within the work society. Outside the big cities in Czechia, it is difficult to find a job for the people whose working capacity is restricted. With the limited options for being employed in the appropriate work conditions, e-waste becomes the option to avoid unemployment. As Jarda, the young boy who worked at the sorting line, told me, there are very few sheltered workshops in their region. With his friend, they created a group of self-advocates and tried to help people with similar job issues. The problem is that not many companies would offer jobs to people with disabilities. Mostly, there are merely possibilities of where to spend leisure time and get entertained. He was ambitious to change some of his conditions. During my stay at EREDA, he demanded a legal capacity at the court, and he was successful. His idea to form a group of self-advocates was inspired by the practice he encountered in Great Britain. It was also a reaction to his dissatisfaction with the approach of the social workers. When I asked him whether they were too arrogant, he answered no. The problem was that they treated them like small children. He considered a meaningful job a critical step to becoming autonomous.

The conviction that employment and work are valued was ubiquitous at EREDA, where most workers lived in villages and cared about the house and the

[19] Todd Carmody draws upon Andre Gorz (1997) who refers to work society as defined by an ideology of work. Work is seen not only as an economic value, but also as a moral duty and social obligation.

adjacent gardens or even small fields in a few cases. The character of the work was depicted in the dialogue I had with Michal. I informed him that I had a lot of work at home. He laughed at me about what kind of work I could have as I lived in a flat. The work was linked to his perception of the manual and, most often, strenuous activity. The EREDA workers did not consider their job position as something extra. One day, when I explained to Staňka my research intentions, she reacted that I was researching them because they were waste. Still, they praised those who were employed and thus successful in economic integration.

Todd Carmody (2022) looks at how work started to be represented within capitalism as innately meaningful. This ideology is an inherent concept of what is called a work society that is most conspicuous among the people living at the economic and social margins. "In work societies, in other words, the value of work is not only or even primarily economic. Work is the means by which individuals find recognition in the overlapping social, political, and moral communities that constitute the broader collective" (Carmody 2022: 6). The representations of the working person always depicted a white, able-bodied man, thus excluding non-white people, women, and people with disabilities from the social and political *we*. Following Moishe Postone (1993), he pays attention to the fact that "Marx's point is not only that work is not the essence of human life but also that capitalism goes to such great lengths to convince us that it is. This insight is another and perhaps less likely payoff of Marx's immanent critique: by inhabiting its key terms and rhetorical moves, Marx shows us how capitalism makes work seem inherently meaningful" (Carmody 2022: 10). The tendency to highlight the value of work and employment was in the context of EREDA given also by the socialist past in Czechia when everybody had to be employed. Within this ideology of work, EREDA's workers strived to resist becoming perceived as human waste through hard work with e-waste.

In his book Wasted Lives, Bauman (2004) calls human waste the people who became redundant in the modernisation process. He states, "The production of 'human waste', or more correctly wasted humans […], is an inevitable outcome of modernization and an inseparable accompaniment of modernity. It is an inescapable side-effect of order-building […] and of economic progress […]" (Bauman 2004: 5). Bauman describes two ways in which human waste is created. The first one is designing

the world when the useless and redundant is put aside. He mentions that waste is the dark secret of production. The second one draws on economic progress and modernisation, which brings up the groups of people not easily included in the system. Those can be refugees and asylum seekers. He shows how the market discards everything and everybody who could pose a risk to economic progress and prosperity. His book constitutes the critique of modern global institutions and the systems they create and is not meant to humiliate those who are mostly excluded. However, his analysis neglects that the use of that metaphor might be problematic.

Gillian Wylie (2014) points out that one of the shortcomings of the human waste metaphor is that Bauman does not consider people's agency in his work. Moreover, and what I argue, his analysis omits the resistance that arises from these people and state institutions. Another problematic aspect is the risk of misapplication of his provocative label. Alexander and Sanchez (2019b: 16–17) state that "simply to call these wasted lives is to recapitulate analytically the expulsion into indistinction that modernity has inflicted on them." They also avoid Bauman's term due to its failure to see the potential of value recovery. Nevertheless, Bauman is not the only one who uses the metaphor of waste to portray the improper classification of a specific group of people. The cases of using waste metaphors for people seen as surplus were nicely summarised by Kathleen M. Millar in her book Reclaiming the Discarded (2018). She asks not only what led to the use of garbage metaphors but mainly, "What were the consequences—both for theory and politics—of understanding the unemployed in these terms?" (ibid.: 5) Referring to a crisis of work connected with the increase of unemployment in the 2000s, and so-called precariat, she depicts how the metaphor of disposable life became common outside studies on work and employment. It led to defining the poor and marginalised in terms of scarcity. Her book then criticises "scarcity as a persistent paradigm for understanding lives lived in precarious conditions" (ibid.: 8).

There are mainly two diverse strategies of resistance that are applied to prevent from being labelled human waste. The first one is led by the state and state's institutions and is held in the discourse of care and protection. People whose potential could be wasted, or rather their labour capacities could be lost, make the ineffectiveness of the market economy visible and need to be prevented. The state strives to find employment for those at risk in the job market; therefore, it supports the employer by subsidising

wages and offering various market advantages. The second one is emerging from the people themselves. They perceive work as a crucial value, and regardless of the work, they praise those who work, including themselves.

Dependence on disability

When we finished sweeping around the sorting line, I saw Michal standing by the door, watching something. I came to him, and he told me that somebody was taking "our" material. Petra added that it was already a second lorry. Michal explained that Gabriel, the foreman, probably talked to the chief manager, and they sold it to somebody for a few bucks. I did not quite understand it. Earlier, Michal told me it was necessary to cut the ends of the cables in "our" material. Based on that, I assumed a higher financial value in this material when more work was needed. Michal clarified that it is more favourable for the company when we purify the copper than when we work on "our" material. He continued that if there were no other work for us, it would probably be without a problem to sort "our" material. But it is too strenuous work for us. Michal also explained that it would always pay off for EREDA because the company obtained ten thousand crowns as an allowance. It means that even today when we were slow, we made more money than enough for ourselves. He continued that it was because of the price of copper, which was, as he thought, redeemed for 120 CZK per kilogram.

The allowances the company got for employing people with disabilities were quite a debated topic. Once, I heard Emanuel and Jakub wondering where the money the company gained as a subsidy went. They claimed that the company got for those with a third degree of disability 14 thousand crowns, for those with a second disability degree 12 thousand crowns, and for those with a first degree 10 thousand crowns. However, their assumption did not correspond to the information on the website of the Labour Office of the Czech Republic (n.d.). A company employing more than 50% of people with disabilities is part of the sheltered job market. It is also the case of EREDA, which employs approximately 87% of people with disabilities. In 2020, it had 99 employees, and 87 of them were people with disabilities. In the sheltered job market, the company gets for each person with disabilities a fixed month flat rate of 1,000 CZK. Besides, the employer receives 75% of the employee's actual wage. The wage subsidy represents an essential impetus for the employment of people with disabilities. As

Gustafsson, Peralta and Danermark (2014: 258) show, it is seen as compensation for the lower productivity. Their interviews with employers demonstrate that people with disabilities affecting productivity would not be employed without subsidy. I observed that the working capacity of many employees was the same as that of the able-bodied people.

The speculations that Emanuel and Jakub developed demonstrated the opacity of the company's economic activities. There was a dominating feeling of undervaluation among the workers. It was accompanied by several complaints. The workers expressed discontent about a low wage[20], the risk of losing their degree of disability and related benefits, and hard work that did not correspond to their health problems. The awareness of the company's subsidies even increased the frustration from the low wage. Some workers mentioned that they did not feel sufficiently rewarded for their hard work. The other workers tended to work only to the extent they calculated corresponding to their wage.

Romana, a talkative woman working next to me, did not get any disability benefits because she did not have OZP status. Once, when we stayed together working overtime, she told me she was bothered because the other employees had more money than she did. Moreover, she thought she received a smaller bonus than her colleagues. She was convinced that the supervisor did not want to give her more because the foreman, Gabriel, told Romana that he had suggested a bigger bonus. However, the supervisor cut it down. Romana thought that it was caused by the fact that she was talking whenever the supervisor entered the upper workshop. Romana talked a lot but also worked hard, as I could have observed. Further, Romana explained that, unlike others, she could not afford to take too long sick leave because she would not have been financially secure.

The other workers who received disability benefits were, however, also insecure and unsatisfied. The biggest concern was the uncertainty of the recognition of their benefits. Alice, a fifty-year-old woman working in the upper workshop, complained about the decisions made about the distribution of disability degrees. She had Ankylosing spondylitis (also called Bekhterev's disease), and recently, she discovered

[20] The employees are paid only slightly more than a gross minimum wage which was 14,600 CZK per month and 87.30 CZK per hour in 2020 (Ministry of Labour and Social Affairs 2019).

some protuberances on her neck. Although she still suffered from the pain, her disability degree was decreased from two to one, which meant lower benefits. The social security system in the Czech Republic differs in three degrees of disability[21] according to the degree of reduction of the person's work capacity (the first degree refers to the reduction of 35%–49%, the second 50%–69% and the third 70% and more) (Czech Social Security Administration n.d. a). The amount of the disability benefits depends on the basic and percentage assessment. The percentage assessment is derived from the length of insurance time, income before the onset of disability and the degree of disability. The basic amount is fixed; in 2020, it was 3,490 CZK (Czech Social Security Administration n.d. b). The full disability benefit for people with first or second degree could be between six to eight thousand crowns.

The category of disabilities represents a crucial classificatory tool in the citizen-state relation as it guarantees state support to those diagnosed as having a degree of disability. It also brings attention to the citizens who may have specific troubles navigating their lives. The classification of those with disabilities is based on their capacity to work. It assumes that a person's value to the state lies in her contribution to economic progress by actively working for it. Such an idea is also internalised among those workers.

In the context of the uncertain disability benefits, a discussion between Eva and Nikola was interesting. Nikola claimed that the situation was better earlier. She did not specify when exactly. The Labor Office did not exist, nor the disability benefits, but everybody had a job. The people who were apprenticed had to stay working at the same enterprise that funded their education, so they could not have slacked off. Eva added that young people nowadays count on the old ones to give them money, so they do not work. Nikola pointed out that it was because we let them. Such lamentation demonstrated, on the one hand, their exhaustion from the system of disability benefits and, on the other hand, the emphasis put on the value of work and employment, which I examined in the previous section.

The fact that surprised me was the length of the sick leave. It was common for the employee to spend three weeks or more on sick leave. Sick leave opened up the

[21] *Invalidita prvního, druhého a třetího stupně* (the literary translation would be „the invalidity of the first, second, and third degree")

space for manoeuvring and applying the agency of workers in strategic and calculative ways. Staňka, a sixty-year-old woman who was before retirement and was very close to me, speculated on Markéta's sick leave. She told me that Markéta was on sick leave for most of the year. Staňka thought Markéta had it calculated, so the insurance company paid her something. She had a sister who worked as an insurance agent and helped Markéta arrange it. Sick leave was also approached as necessary to keep receiving the disability benefits. This notion was presented to me by one employee and doubted by the chief manager. He instead complained about the insufficient number of employees in daily operations caused by the high sickness rate.

Based on the findings from interviews with employers of people with disabilities, Gustafsson, Peralta and Danermark (2014: 264) state: "The value of the human seems to be assessed in terms of the interests of productivity and, hence, in relation to economic profit." Despite the expectation of considering the human rights perspective by employers, the authors have observed a rather utilitarian approach. The productivity and economic profit seemed to be apparent goals in the context of the competitive market at EREDA, too. On the one hand, due to the wage subsidies, the employment of people with disabilities might be perceived as cheap labour. On the other hand, this labour force was characterised by its instability and, in some cases, unreliability concerning work attendance, which was affected by the high sickness rate.

Although the sorted materials were sold to buyers who required certain quality, for example, regarding the proportion of plastics, the pressure on the quality was not the same as at the manufacturing plant. The manual disassembly generally guaranteed the best quality of the sorted materials. Thanks to the state's subsidy of workers with disabilities, the company could provide this type of disassembly. Moreover, some types of electronic waste, such as televisions and computers, require manual decomposition. However, this kind of processing is expensive compared to a crusher, which is more efficient[22] and cheaper in total. It seems that people with disabilities are indispensable in this context. The chief manager confirmed that when he told me how difficult it was to find new workers. Therefore, the dependency also goes in the opposite direction. Besides the dependency of people with disabilities on e-waste and its supply from the

[22] The crusher crushes 150 washing machines an hour. Formerly, one employee spent 12 hours dismantling 25 washing machines.

collective system, the most quality disassembly is dependent on the same people with disabilities.

Summary

During my stay among the people working with e-waste, I mentioned a few times that my research aimed to investigate why people with disabilities work in the e-waste recycling sector. The answer seemed to be simple. My co-worker at EREDA, Luboš, replied to it without hesitation: "Who else would do this job?" He further added that this job is nuts (*na palici*). When I talked about it with the representative of the association of e-waste recycling companies, he asked in a similar way: "What else would they do?" Both reactions were based on the fact that e-waste disassembly could be a stereotypical task. However, in production, the stereotypical work is not usually occupied by people with disabilities. I discern two particular reasons that play a significant role. First, the work with the waste assumes less value that could be lost. As Staňka once put it: "We have nothing to spoil." Second, employing people with disabilities is subsidised by the state. It enables the company to reduce the costs. The question for the workers was often whether they produced sufficient economic value. Thanks to the subsidy, e-waste can be dismantled manually, which would otherwise be too costly.

Although there was no pressure on the quality of outcomes compared to the manufacturing process, the e-waste recycling sector represents a lucrative business. It led to pressure on work performance and the calculation of the most efficient ways of recycling. Such an efficient way may involve the use of machines instead of manual labour by people with disabilities, as was the case with the collective system that prevented sheltered workshops from accessing e-waste. The pressure on work performance highlighted how easy it was to make various types of disabilities invisible. The work and the potential of the people with disabilities could have been extracted in the pursuit of economic profits. However, this was not the only result of the connection between disability and waste. E-waste has been shown to be helpful as a tool for therapeutic care. Except for recovering the value of material, the people could be, through the work on the revaluation of discarded electronics, re-integrated into a society based on the ideology of work. People also perceive the value of work as essential in their lives without considering the possible environmental benefits of recycling. Despite

being dependent on e-waste, which was often the only work opportunity, they were aware that e-waste was also dependent on them.

The entanglement of e-waste materials and people with disabilities makes it questionable to understand the category of disability as related to vulnerable individuals who lack abilities. The workers in EREDA had richer identities that included the capacity to navigate their trajectories in order to have a good life. They had significant health issues that could make some activities harder or unfeasible for them. However, these people were able to calculate their options in their interest as their strategies regarding sick leave show. As Doherty and Brown (2019: 7) mention: "While the environmental and embodied effects of waste work can be devastating, waste workers are not tragic victims of transnational dumping, but are actively involved in shaping waste flows." In the following two chapters, I will further point out the workers' abilities. I will also focus on the second concept in question—waste, specifically e-waste.

2. Classification freedom

My working days at EREDA, a company that processes e-waste, were characterised by a strict time regime. At half past six, the start of the working day, every worker was expected to be at the table and ready to start working. The company's management required that employees arrive at least five minutes before the working day began and leave no earlier than five minutes after the working day ended. Over a period of time, I observed that, while the work discipline was strict concerning punctuality, it was loosened in other aspects of work. On my first day at EREDA, the foreman, Gabriel, brought me to the sorting line, where the workers sorted the valuable parts of crushed washing machines, microwave ovens, dishwashers, and other appliances (Figure 5). Michal, the boss of the sorting line, showed me quickly the funnels where we were to toss aluminium, 'dirty' aluminium, iron, internal cables, and other materials. Then, the

Figure 5 The conveyor belt at the sorting line.

conveyor belt started moving, and there was no time for a more detailed explanation. Later, I realised that each new employee was supposed to obtain knowledge and skills

on the fly. The looseness in how the operating procedure was transmitted became evident also in the sorting and disassembly practices. When the workers sorted ambiguous materials, such as 'dirty' aluminium, they sometimes opted for strategies that skirted the established rules. I refer to this phenomenon as "classification freedom". This classification freedom contrasted with the rigour and discipline applied to punctuality and the workload demanded by the employer.

It is puzzling to see that a sphere of e-waste recycling labelled a 'gold mine' in public media (Česká spořitelna n.d.; Editorial staff Euro.cz 2005; Enviweb 2017) or what Jacob Doherty and Kate Brown call a "multi-billion-dollar trade" (2019: 7) can incorporate such freedom in its operating procedure. Catherine Alexander and Joshua Reno (2012b: 25) also emphasise the profitability of the global recycling economy when they mention that "to the brokers of […] recycling processes, there is often considerable monetary and moral currency to be gained." The market prices of metals, the most valued parts of e-waste, change unpredictably. From the first moment at EREDA, I was surprised by what appeared to be a stable order of sorting, manifested by spatially organised crates, bags, and barrels, each with a sign describing the name and the number of materials (Figure 6). On the one hand, it could be seen as the materialization of the anticipated precise operation to prevent any mishandling, as improper e-waste handling might pose a risk. On the other hand, this order and stability did not correspond to my expectation of flexibility in sorting materials in a way that could react adequately and quickly to the unstable metal market. Instead, I found out later that a kind of flexibility does exist, but for entirely different reasons and objectives—classification freedom. I ask, then, what allows for freedom in classification?

Figure 6 Spatially organised crates at the upper workshop.

I look at *freedom with a small f*, as Claudio Sopranzetti (2017: 71) refers to the everyday negotiations of freedom shaped against "a local experience of unfreedom" and "entangled in the complexity of people's experiences and political-economic transformations". Based on his ethnographic research among motorcycle taxi drivers in Bangkok, Sopranzetti explores how they relate to freedom, *'itsaraphāp*, as a fundamental aspect of their lives characterised by precarious work and health risks. He looks at freedom "as both an emancipatory and an oppressive force" (2017: 69). He opposes two approaches he perceives as prevalent in understanding freedom in social sciences. The first Marxist approach, drawing upon Karl Marx, considers a person as someone on whom freedom has been imposed. The drivers in Bangkok are then seen as those who received "the freedom to exploit themselves by becoming their own bosses—entrepreneurial subjects who accept unstable and unsecure employment." (ibid.: 70) The second approach assumes that humans are "*obliged to be free*" (ibid.: 71). Both approaches, as criticised by Sopranzetti, work with humans as passive subjects and a "universal conception of Freedom—with a capital *f*". Instead, Sopranzetti focuses on *freedom with a small f* that is formed within a specific context.

Following Sopranzetti's approach, I view freedom as being formed in the ecology including humans, materials and their environment. Freedom in e-waste recycling appears to be complementary to the pressure on work performance described in the previous chapter. Although the workers are alienated from the products of their work in the sense that they do not decide about the destiny of the materials and do not influence the operation of the company, this freedom provides them with a space for finding a relation to the materials and to get entangled with them differently. In EREDA, I noticed the freedom in the sense that the workers had a free hand in making decisions about certain types of materials or discarded electronics and thus had power over them. I argue that this type of freedom is allowed not only by the nature of e-waste recycling, which has reduced demands on the quality of outcome materials but also by specific registers of value in which the e-waste recycling is embedded. I further state that freedom in classification works as a way to appropriate the alienated work results. It also promotes other kinds of value than economic that, in the end, can contribute to the economic efficiency of the company. I search for ways in which freedom becomes a crucial part of workers' everyday practices, although it remains inarticulate. In this direction, I tend to understand freedom as a desire to discover new possibilities for transformative action (Sanchez 2020) and as the opposite of necessity.

I use the term classification to join all the activities that decide the destiny of things in the recycling company. Classification freedom then refers to various approaches to that decision-making. I examine the paradox of classificatory freedom juxtaposed with the rigid ways of knowing and representing e-waste (Alexander and O'Hare 2023) as a precious resource of secondary raw materials. I start with sorting as a specific moment related to the valuation of objects. I understand sorting as a profound act of classification that may be learned, copied, and experienced as a norm, or reflected upon, assessed, and turned into a creative moment. I build on the work of Émile Durkheim and Marcel Mauss (2009), which laid the groundwork for an anthropological understanding of classification; in opposition to psychology and philosophy, they emphasized how classification is a product of social context and social structure. Classification is often perceived as the moral and ethical process by which people bring order to the world (Bowker and Star 1999; Lévi-Strauss 1966: 10; Rapport and Overing 2007: 32). Classification leads to clustering objects of similar value (Greeson, Laser,

and Pyyhtinen 2020: 157; Tsing 2013) and determining how objects are managed (Reno 2015: 558). Waste occupies a specific position within classification systems; it "always dwells at the margins of our concepts" (Kennedy 2007: 7). The scholarship focusing on waste and discard observes classification mainly from the perspective of the categories it creates and the consequences it carries (Alexander and Sanchez 2019b; Gille 2007). I focus on classification as the process by which one decides to what category a given object belongs and, as such, what value it gains.

Value seems to be an essential reference point for understanding waste (Alexander and Reno 2012a; Alexander and Sanchez 2019a; Hawkins and Muecke 2002; Reno 2017; Thompson 1979). Alexander and Reno (2012b: 24) describe how recycled materials acquire multiple kinds of value. The most discussed value in the scholarship on recycling and sorting is what could be summarised under the term "economic value". Focusing on the deformation practices linked with e-waste in a high-tech recycling facility in West Germany, Stefan Laser (2020: 223) emphasises the creation of economic value in this entanglement. Similarly, Waqas Butt (2023: 545), who deals with knowing and unknowing waste by formal and informal sectors in Lahore, Pakistan, states that "money is thus one particular form of value that comes to be the standard against which these materials are evaluated and exchanged". He refers to the exchange value, which I categorise under economic value. When Andrew Sanchez (2020) describes how transformation processes impact the satisfaction of work, he thinks about transformation in terms of economic value. Other authors approach value as unspecified and defined primarily by its obscure relation to waste (Corwin 2018; Gregson et al. 2010). Highlighting economic value reflects the current state of the recycling economy, in which waste is creatively used as a source of significant profit. Although waste is mainly considered from the economic value perspective, other kinds of value are not entirely forgotten (e.g., Hawkins and Muecke 2002; Sanchez 2020: 87). In the daily practices of workers at EREDA, I also notice the other kinds of value, namely moral, trophy and sentimental value that designate the specific forms of belonging to the materials, environment and other people.

Value in the studies I have mentioned is understood as an attribute that belongs or is ascribed to waste materials or waste work. I aim to reverse the perspective: besides looking at what kinds of value the classification and recycling practices form, I focus on

what kinds of value recycling is embedded in. This perspective was already implied by Alexander and Reno (2012b: 15), who describe "economies of recycling" as "an economically productive enterprise no less lucrative and no less morally complex than other modes of material transaction." As such, I approach recycling as the process of transforming value, materials, and use embedded in multiple registers of value. The registers of value then represent a specific combination of value orientations imposed on the action. The exploration of registers of value resembles what Gille (2007: 9) addresses as the waste regime when she pursues "social patterns of the social nature of waste" (ibid.: 34). The concept of "waste regime" refers to how waste is produced, represented, and politicised. On a smaller scale, I aim to comprehensively encompass the processes and social relations associated with e-waste recycling by revealing the registers of value. I look more closely at one type of waste stream (Reno 2015: 559) and its management, elucidating the registers of value in which e-waste recycling occurs while focusing on the relation between these registers and the classificatory practices involved in the operating procedure.

E-waste designates devices and appliances that require electricity or electronic parts to be functional but that have become obsolete, unfunctional, or unwanted and were discarded. Determining when an electronic device becomes e-waste (Lepawsky and Mather 2011: 243) is difficult. Furthermore, e-waste has the potential to be assembled and disassembled into materials that are further dumped, incinerated, or resold and reused. This process of reassembly, re-evaluation, and relocating—in other words, transformation (Laser 2020; Lepawsky and Mather 2011; Sanchez 2020)—assumes a multiplicity of forms, meanings, and roles, making the nature of e-waste blurred and illegible. Classification then represents the crucial action that decides the further trajectory of material and its value and use. Classification occurs in specific conditions defined by the involvement of e-waste recycling in a broader network of relations. E-waste recycling in Czechia is framed by European Union and Czech legislation that specifies Extended Producer Responsibility (EPR).[23] EREDA employs people with disabilities, or in other words, those with reduced working capacities, and thus has an advantageous position in the market guaranteed by the state. It further

[23] "OECD defines EPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life-cycle". (OECD 2001: 9)

collaborates with the collective systems that provide waste materials and financing. This specific web of obligations and advantages is associated with the registers of value affecting the operation of the e-waste recycling companies.

In this chapter, I describe the daily negotiations of value and classification by disassembly workers and provide a glimpse into one episode of the transformation of electrical and electronic equipment's value and material qualities. My ethnographic experience demonstrates that classification freedom is enabled by the specific stabilising effect of the broader network of relationships in which recycling at a certified e-waste processing facility is embedded. At the beginning of this chapter, I describe the working environment at EREDA, focusing on the distinct workspaces and the processes that occur there. In the second section, I introduce this broader context of e-waste recycling in Czechia and focus on the stabilising forces that constitute the inner atmosphere of the company and represent a vital part of the registers of value. In the third section, I examine what characterises classification freedom and, together with Laidlaw (2002), specify the meaning of freedom in relation to agency. In the last two sections, I deal with the various kinds of value that intervene in classification and discern moral, trophy, and sentimental value. Except for these kinds of value, the last sections address the materials involved in the disassembly process and analyse their connection to the ways of knowing.

E-waste Processing at EREDA

EREDA was one of the largest e-waste processing companies in Czechia. In 2020, the company processed 5,200 tonnes of e-waste, which made up 6% of the e-waste processed in Czechia in total. As I mentioned in the previous chapter, the company had around 87% of employees who had disabilities. EREDA was located at the periphery of the regional town within a vast industrial area that belonged to its holding company. The part owned by EREDA was quite large as it consisted of two spacious buildings, one bigger and one smaller yard. The bigger yard was delimited on one side by a six-meter-high shredder and on the other by a funnel that flew on the conveyor belt. In the 90-meter distance between them, the overhead crane operated and filled both mechanisms with various mixtures of e-waste piled in this yard. The smaller yard was adjacent to the bigger one and was bounded by two buildings and the portable building

where the conveyor belt disappeared. The smaller yard was usually busy with fork-lift trucks organising newly imported discarded electronics. The workshops were situated in both buildings, but the largest part was in the higher building, the first building one encountered after getting through the reception. The second building mainly provided space for administrative offices. Like most of the other e-waste processing companies I visited, the outdoor space of EREDA was clearly arranged.

The e-waste recycling at EREDA was done primarily by machine shredding and manual disassembly. The shredding involved big appliances such as washing machines, dishwashers, ovens, or microwave ovens. Right after crushing, the magnet separated iron from shredded appliances. The workers standing at the conveyor belt of the shredder put aside motors and other larger pieces (Figure 7). The rest of the crushed material went to the sorting line at a portable building. During the five months, I worked in two working environments, the portable building and the so-called upper workshop located in the first higher building. In the portable building, workers picked and sorted materials from a conveyor belt that moved an indeterminate mix of various parts of

Figure 7 Sorting at the shredder.

crushed appliances. It was necessary to catch the valuable materials; those left undetected on the conveyor belt proceeded to the huge container bound for the landfill. This work was demanding; one had to stand the whole day and lean over the sorting line; the materials were dirty and often wet; the working gloves provided were not waterproof; and the portable building was filled with various odours. Due to these unpleasant working conditions, the turnover of workers was relatively high at this working position.

In contrast to the sorting line, the upper workshop provided a pleasant, though noisy, environment. It was located on an upper floor in one of the company's two buildings, so it was warm and dry in the cold winter months. The employees of the upper workshop usually stayed in the same position for a longer period, two or more years. The work involved the manual disassembly of electronic devices, such as PC monitors, LCD televisions, mobile phones, and laptops, into smaller pieces, whose raw materials could be mostly easily distinguished. This distinguishability contrasted with the material indeterminacy in the portable building caused by the shredder, which randomly transformed clearly defined appliances into irregular pieces of various shapes.

Figure 8 The mixture of various e-waste parts at the sorting line.

In contrast to the *bordel* (mess) at the sorting line (Figure 8), as one worker put it, the work and materials in the upper workshop were considered quieter and better organised, although physically strenuous, too.

While in both environments, the work of sorting and disassembly involved classification, in the portable building, classification was impossible at the stage of whole appliances because the workers did not even encounter them. In the upper workshop, workers sometimes discovered a functional device. When that happened, instead of disassembling it, the workers either used it in the workshop or took it away to their households. Testing and investigating devices seemed to be a natural part of daily work activities; only occasional nervous looks towards the door indicated fear of being caught by the supervisor. Under an amendment to the job contract, taking things out without documents was considered a serious breach of professional discipline. Workers were cautious when their classification practice deviated from the standards, although they knew management carried out similar practices.[24]

Registers of Value

When I returned to EREDA for a one-day visit in February 2021, I felt inappropriate. I was sitting on the sofa in the heated chief manager's office while watching workers, who were not so long ago my colleagues, through the window, throwing heavy buckets of trash into the container outside of the portable building. "We changed to industrial processing because there is less in the appliances." The chief manager continued to reply to my question about the change of material structure in e-waste over time. "We need to have a yield of materials, but if most of the weight of material consists of plastics that represents a negative value, the price of labour increases, but the proportion of valuable materials in e-waste decreases. The idea of e-waste as a gold mine is probably floating around in public space, but it is not true anymore. You can see it on the new printed circuit boards whose price is twice less than of the old ones."

The company EREDA was founded in 2000, and in 2006, it was established as a sheltered workshop that employed primarily people with disabilities. In 2009, EREDA bought another sheltered workshop that was formerly part of a big company in the region. With this fusion, the employees were moved to the new company. In 2020,

[24] I will elaborate on the issue of taking things away from the company in the following chapter.

EREDA employed almost one hundred workers, and 87 of them were people with disabilities. When I talked with the workers about how long they had been employed at EREDA, one co-worker told me she had already worked there for 25 years. I realized some employees' knowledge about the company's existence was hazy. As I described in the previous chapter, EREDA was part of the sheltered job market because more than 50 per cent of its employees were people with disabilities. The company got subsidies from the state for every employee who had reduced working capacity (was recognised as *osoba se zdravotním postižením – OZP*).

EREDA was a certified e-waste recycler. The company obtained the discarded electrical and electronic equipment either directly from businesses and people or companies operating in compliance take-back schemes, in other words, the collective systems. "Collective system" is a literal translation of a Czech designation that derives from the fact that these companies fulfil the obligations of several producers. There are five major collective-system organisations in Czechia. These non-profit companies were founded by producers in compliance with the EPR set by WEEE (waste electrical and electronic equipment) Directive 2012/19/EU of the European Union. In practice, this means that a consumer's price for an appliance includes recycling costs. The recycling costs are set by the collective-system organisations that require them from the producers to finance the collection, transport, and processing of e-waste. Each collective-system organisation has contracts with producers as well as with recyclers. I describe the arrangement between EREDA and the collective system called Gamma.

EREDA gets from Gamma the contracted amount of e-waste and the monthly rate for the processing. The e-waste belongs to Gamma, which prepares monthly tenders for sorted materials. The profit from the sale is shared between EREDA and Gamma. The profit from EREDA's own and Gamma's materials and the monthly rate from Gamma and state subsidies constitute the company's primary income. EREDA is a subsidiary of the holding company that joins subsidiaries specialising in waste management and recycling. It provides EREDA with a stable purchaser of sorted materials, as one of the subsidiaries recycles metal. Still, the sale of Gamma's materials to this subsidiary is negotiated as part of the monthly tender.

EREDA is entangled in a network of stakeholders that significantly shape its operation. Based on these relations, I claim that e-waste management in Czechia is

embedded in specific registers of value that include environmental, political, social, and economic orientations. It resembles Gille's social theory of waste, which introduces the term "waste regime". With this term, Gille pursues the economic, political, and material dynamics through which "waste is produced, how it is conceptualized, and how it is politicized" (2007: 9). Instead of elucidating the complex of "the production, representation, and politics of waste" (ibid.: 34), I intend to disentangle the conditions allowing for classification freedom. For this purpose, I focus on registers of value and the main orientations presented in e-waste processing. First, environmental orientations perform differently at two levels. At the state level, they arise from avoiding the consequences of improper e-waste processing on the environment, such as dumping toxic waste in landfills. At the level of the recyclers, the environmental orientations involve the effort to salvage raw materials, prolong the life of appliances, and avoid burdening the planet with mining (Arboleda 2020).

Second, the political orientations are most visibly manifested in the obligation of the state and the companies involved in e-waste recycling to comply with EU regulations and directives. Third, according to EREDA's website, their main goal is to "employ the maximum possible number of people with reduced working capacity while maintaining the economic stability of the company."[25] The statement points to competing yet interconnected social and economic interests. At EREDA, social engagement is manifested in the employment of people with disabilities, thus offering a job to people whose position in the job market is vulnerable. Fourth, care for disadvantaged people is accompanied by economic orientations that underpin the effort to develop the company by achieving profit while also, and more importantly, maintaining the stability of the company.

These orientations point to the general directions in e-waste recycling in Czechia and the specifics of the company in the sheltered job market. Although I work only with their summarisation, which represents a part of the more complex waste regime, the description is sufficient to notice the aspects that promote freedom in classificatory practices. I argue that the orientations constitute steady grounds with the stabilising effect that renders a secure working environment. Waste work is usually conceptualised in terms of precarity, marginality, painfulness, health risks, and other negative

[25] Website of the company EREDA. Accessed June 27, 2022.

adjectives (Doherty and Brown 2019; Millar 2018; Sanchez 2020). The stabilising effect of the registers of value contributes to creating working conditions that are not precarious. A worker at EREDA does not live a "life without the promise of stability," as Tsing (2015: 2) characterises precarity. Even if the precarity were defined more generally, the working conditions at EREDA would not necessarily be considered precarious. Rebecca Prentice (2020: 117) mentions a notion of precarity that could be applied globally "as a broad descriptor for conditions of life and labour characterized by unpredictability, difficulty, danger, and dependency," and Kathleen Millar (2018: 69) says it could be accompanied by "states of anxiety, desperation, unbelonging, and risk." Stability at EREDA provided by the network of four actors—state, collective-system organisation, holding company, and recycler—allows for classification freedom, predictability, and constancy, thus providing conditions not ascribed to precarious work. Still, it does not guarantee safety[26] in working procedures when handling substances hazardous to one's health, nor does it guarantee a wage higher than the minimum. Although it does not solve some problematic issues, classification freedom represents the specific moment of transformation that can lead to satisfaction from work (Sanchez 2020).

Classification Freedom

One day in late September, Emanuel, a *pevný*[27] man in his fifties, started to pull out various old smartphones from one of his usually well-locked drawers. Among others, there was an HTC Touch HD from 2008. I came closer to Emanuel's desk and watched as he tried to get it working. The welcome display in English appeared. Emanuel handed me the phone to try to set it in a language he did not know. At that moment, the supervisor came into our workshop. Emanuel motioned to me to lay the phone down. When the supervisor left, we returned to the exploration. We discovered the touch

[26] I differ between security and safety. I build upon Zygmunt Bauman (2007: 13), who refers to the global politics of fear and argues that "the vicious circle [of fear and fear-inspired actions] in question has been displaced/shifted from the area of security (that is, of self-confidence and self-assurance, or their absence) to that of safety (that is, of being sheltered from, or exposed to, threats to one's own person and its extensions)." Security in such a view is linked with certainty and stability, whilst safety anticipates the threat. In the e-waste processing company, a threat might be a toxic material or any other risk of physical harm.

[27] In the region where I conducted my research, an obese person was called pevný (solid), whereas thin people were called *chudý* (poor).

display was not working, so he took the next phone, and we continued exploring. It was impossible to turn this phone on. Therefore, Emanuel found a suitable charger in his drawer and put it into the wall socket. After a while, Emanuel tried to turn the phone on again, but it did not react. I told him to wait. Emanuel wondered why even the light was off. Still, he left it in the wall socket longer on my recommendation. Suddenly, Emanuel got the idea to check the battery. He separated the back cover and found out that it had none. I burst out laughing. A little bit annoyed, he took the phone and threw it away in the barrel where the discarded mobile phones were collected.

Classification in e-waste recycling occurs at several levels. It is essential to do more than merely passively sort materials into the given categories, where the classification process is more or less automatic (workers already know what to classify, and they have available categories). Making decisions about discarded appliances plays an equally significant role. When taking an appliance onto their working table, most employees inspected it if they had time and if it seemed to be potentially functional. This inspection of appliances and other electronic devices was a vital part of the working routine, especially in the upper workshop where the devices were disassembled. It did not matter what kind of device it was. If the device worked, a use for it was sought within the workshop, or it was taken home by its finder. In some cases, it was offered to colleagues. Usually, the investigation attracted the interest of other workers. Thus, all shared their knowledge to reveal the machine's functionality, use, and role. Sometimes, the investigation required searching for other components (cables, batteries, chargers), which were usually easy to find. Like Emanuel, many workers hung onto components or knew who else to ask for them.

E-waste is an ambiguous category in terms of its waste characteristics. The Czech law addresses e-waste as an end-of-life product. This term could be understood as what Alexander and O'Hare call "rhetorical invocation" used "as a technology of unknowing wastes" (2023: 437). With increasing attention to circularity, it is expected that, despite a product reaching the end of its life, its parts will be further recycled, reused, or recovered (Lepawsky 2018). In contemplating the processes related to e-waste, one should be aware of the ambiguous character of this type of waste. On the one hand, it is something discarded, non-functional, dirty, and used. On the other hand,

some of its materials are attractive due to their economic value. At EREDA, I noticed that different kinds of value other than economic value also served as a lure.

The broad scale of possible trajectories of e-waste or their parts contributes to the classification freedom. Freedom accompanies classification from the moment the discarded appliance enters the workshop until it leaves. In their entanglement with materials, workers classified the devices and appliances starting from first contact based on their appearance, functionality, and possible use. This moment of classification, when workers decided whether they would have disassembled, taken, given, or shared a particular device, was as important as the subsequent sorting and classification of disassembled parts. The workers exercised the freedom to decide even before they dismantled the device. Although employees were forbidden to take things away under the contract, almost every worker had appropriated some functional or attractive things at some point. The workers tried to keep it a secret and underwent some tricks to hide their practices. Moreover, the company's management was not very strict in its controls. It means there were no inspections of the workers and their bags or backpacks at the reception. To some extent, the management was aware of the practices of the workers partly participating in them. When I confronted the chief manager of EREDA with the illegality of taking something from the company, he replied that he did not think it should be done. On the contrary, he mentioned that reuse represented the second position in a waste management hierarchy. This means management tolerated classification freedom, even though they never fully admitted it. A certain freedom was further allowed during the disassembly process when the worker could decide how carefully to disassemble some parts. The category into which the workers separated ambiguous or hard-to-disassemble parts was called "Austria". I describe this category in more detail in the next section.

Examining the devices before dismantling was not attractive, given the possible economic value of e-waste. Instead, the lure of finding valuable devices was what Anna Tsing (2013: 31) defines as "trophy value". When she illustrates how non-capitalist social relations create the capitalist value of commodities in the example of matsutake mushroom hunters, she reveals how mushroom hunters use money and also mushrooms as a trophy of freedom and how in the mushrooms—"the pride of the hunt"—the trophy value persists as the "experience of obtaining the thing" (ibid.). The exploration of

a device resembles a hunt or directly mushroom hunting linked with the hope and anticipation of a prosperous future (Sosna 2022: 172). A found functional thing acquires trophy value. The appropriated device becomes a trophy that symbolizes one's freedom, both in the classification of things and, in a broader sense, in the ability to act freely in the stereotypical and routinized work.

Instead of classification freedom, the loosened practices could be explained in terms of the agency of the workers. I follow James Laidlaw (2002) in clarifying the relation between freedom and agency. Laidlaw brings attention to the study of human freedom to prevent the anthropology of ethics "from constantly collapsing into general questions of social regularity and social control" (2002: 315). The concept of agency, he claims, is tempting to describe the world in a way the analysts would like to have it. It means that agency is used to designate actions that are "structurally or transformatively important, or powerful" (ibid.). Laidlaw conceptualises agency as "an index of freedom." Inspired by Michel Foucault, who talks about exercising freedom, Laidlaw understands freedom as a conscious space for reflective decision-making. Explaining the loosened ways of sorting at EREDA in terms of agency would bring attention to the structural impacts of one's actions. I aim to reveal the specific settings in which classification occurs, and I believe that referring to freedom better suits this goal. Moreover, freedom as the aspect reflecting the relation between workers and materials balances the alienation from the work's products described in the previous chapter. Freedom in EREDA's context offers a way of attachment to materials, or in other words, it opens doors for specific ways of human-material entanglement. Therefore, it refers to the dynamic that extends beyond the agency. The ethnographic observation in the following section depicts what aspects intervene in classification, thus providing the space for distinctive ways of acting.

Relation between Knowing and Value

Once, when I was disassembling monitors in the upper workshop next to Emanuel, he told me he had been working at EREDA for eight years. He said it had been different there before when only about 26 people worked at the company. The work was calmer. The category of "Austria" did not exist. I asked him what they used to do with the components we threw into the "Austria" crate. He explained that they more often

dismantled everything. Similarly, Staňka told me at lunch on another day that the foreman prior to Gabriel always wanted to disassemble everything into the smallest parts. “Now it’s different,” she said. Given the price that could be gotten for it, Gabriel considered it a waste of time. During informal talks with workers in the upper workshop, I often encountered nostalgia for the old times associated with the previous foreman, who was retired and sometimes came to the workshop. Once, he appeared and asked for a computer power supply. Eva told him he had come out of the blue, and nothing was left. Next time, she joked, he must submit an order. He replied that the problem was that we did not value those things: “You just demolish everything!” When he left, Jakub, a sixty-year-old worker, told me he was excellent because he understood everything and knew what had value and was worth spending time on. It was Gabriel who did not understand.

During the new foreman’s tenure, a new category of materials was introduced. This category was called by the foreman and all workers “Austria”. The “Austria” crate stood right behind Emanuel and me and presented a unique and mysterious category of separated pieces. It covered a broad scope of things and was associated with various imaginaries. Gradually, I collected different explanations of what happened with the materials, tiny machines, or parts of machines that were tossed into this crate. Some told me that the crate was really sent to Austria. Emanuel claimed it was named “Austria” only arbitrarily, and the materials were sent to *Příbram* (a Czech town with a metallurgical plant). Another worker claimed that it went to the Netherlands. Another theory was that it ended up in a waste incinerator or landfill. After over three months in the company, I asked the chief manager about that weird and ambiguous category. He clarified that the materials were transported to a specialised plant in Austria that pulverises small e-waste and then sorts it out. Classification is interconnected with the definition of the categories. The category “Austria” had multiple interpretations that allowed various things to be assigned to it. In other words, the ambiguity of this category led to freer classification over time.

The “Austria” category was the only category named after the state or locality. It received more attention at the upper workshop than any other category. Calling it “Austria” encouraged the establishment of the imaginary that it was something foreign, exclusive and attractive. These perceptions were further reinforced by the experience of

the workers who discovered interesting things when regularly checking the "Austria" crate. Thanks to its ambiguity, this category offered the possibility to dispose of parts of e-waste and avoid strenuous dismantling easily. At the same time, the category was associated with the ideas of progress, change, and novelty that were rejected on the basis of nostalgia for the better past.

Nostalgia for the previous foreman made the temporal changes in knowledge of materials and classification visible. This nostalgia represented "a yearning for a different time" (Boym 2007: 8) that was shared across the workers as a community (Cross 2015: 9)[28]. The longing for former idealized ways of disassembly enabled the loosened approach to sorting. This approach was accompanied by the statements, I often heard during my research, about wasting one's time in relation to the recovery ratio of materials. As my co-worker Emanuel once explained: "It is not cost-effective to disassemble it." This approach seemed to be the crucial aspect of decision-making. The parts that were difficult to disassemble were usually thrown into the "Austria" crate. The category "Austria" allowed a certain looseness in the disassembly of electronics. This looseness was advantageous for the workers, since it meant they did not have to spend time on painstaking work. When longing for the previous foreman, who was believed to understand the materials and their value more than the new foreman, they were, rather than protesting against the loose category, rebelling "against the modern idea of time, the time of history and progress" (Boym 2007: 8). Moreover, they praised the knowledge that led to thoroughly extracting valuable materials. As Butt mentions: "The sorting of waste materials … recognise[s] and standardise[s] specific qualities of these materials, which facilitate[s] their circulation as potentially valuable objects (see Callon, Méadel, and Rabeharisoa 2002; also Guyer 2004). This sorting involves ways of knowing and working with waste materials, in which mental and physical labour are mobilised to access and materialise value out of these materials" (Butt 2023: 543). It is, however, not only the knowledge and experience that the previous foreman valued. Based on his rebuke about insufficient evaluation of the materials, I believe there is something more than knowledge that enters this field. In my perspective, his conception of demolishing refers to the moral value of the responsible treatment of available things.

[28] Garry Cross (2015: 9-11) mentions several forms of nostalgia, and these include communal, familial, fashion and consumed nostalgia.

Figure 9 The portable building

The sun heated the portable building to a higher temperature (Figure 9). Still, the air-conditioning allowed me, alongside the other nine workers, to search for valuable parts of washing machines, microwave ovens, dishwashers, and other appliances. At the end of the shift in the portable building, we always had baskets filled with all the things that were either difficult to sort, needed more handling, or were unrecognised. We emptied the content of the baskets on the sorting line and, together, examined it. I was trying to separate the inner cables from the small pile when Michal, the boss of the sorting line, stopped me. He told me: “Throw it all to the electro mix.” Usually, only the plastic-metal pieces went to electro mix, and I did not understand why we should not separate the inner cables. Michal pushed me again to throw it to the electro mix and added: “At least we enrich them a bit.” He meant that those who buy electro mix would gain better economic value from the purchased material. It was based on his perception that we throw mostly plastic pieces with only a tiny amount of metal there; therefore, they could not get much value out of it. Michal advised the workers whenever they were unsure where to put a found piece. In most cases, he decided based on the economic value of the material, but when he tended to support those who buy

electro-mix, the economic value was only one element of his decision-making. The other crucial element was the effort to achieve justice.

Classification is contingent upon the workers' knowledge and experience of the materials (Butt 2023). As became apparent from work in the portable building, Michal was aware of the prices of the materials. When an aluminium alloy particle included a small piece of plastic, he preferred to put it into the aluminium alloy category instead of aluminium alloy with plastics. As he emphasised to our co-worker, who could not see the difference, the particle could be worth 25 CZK per kilogram when categorized as aluminium alloy with plastics and 50 CZK per kilogram when categorized as aluminium alloy. His knowledge of the prices primarily determined his decision-making, although it did not have to correspond to the actual prices set by EREDA. However, his knowledge of materials and emphasis on economic value were not the only decisive factors in his approach to electro mix. His decision was based on the idea that the company that bought electro mix would not profit if we mostly threw "trash" in there, as Michal called it. Although he communicated his reasons in terms of economic value, I understand Michal's awareness of "electro mix" as a kind of empathy and the ethical belief in justice. It is a moral value that allows a specific way of classification. Knowing materials is closely related to the value workers impose on the things they treat.

Relation between Knowing and Materials

When I was dismantling various electronics in the "upper workshop," I was struggling with a monitor stand that consisted of black plastic and iron. At that moment, Jakub, a smiling man over 55 years old, passed by me and, observing what I was doing, asked me about it. I replied that I wanted to separate the iron spring from the plastic part. He just took the stand and threw it into the crate for iron. He said: "You just throw it in there, it rattles around, and you have no worries." Then he continued: "When I started working here four years ago, I also wanted to disassemble everything dutifully. The [previous] foreman observed me for two weeks. Then he told me, just throw it here, please. Some things are difficult to disassemble, and spending time with them does not make sense when the recovery ratio is low."

Although Jakub talked about the waste of time in relation to financial profit, his primary approach was different. His classification of the monitor stand was not

determined by its material composition. Instead, he emphasized the worries one could have with its disassembly. In order not to worry, it was discarded in the most effortless way without considering its formal categorization. Not long after this event, he turned to me when I passed him and asked me if I knew what could happen when I disassembled that monitor stand. He went on without expecting an answer, explaining that a small spring inside could shoot out and hit me. Therefore, he considered it dangerous to disassemble such a piece.

His concern highlights how the qualities of the materials affect the classification. In a similar way, Olsen (2010: 5) stresses how the material aspects contribute to the formation of "social order, structural durability, and power." The qualities of things extend to the level of size, temporality, or functionality. They become significant in relations. Still, as Olsen notes: "These different properties are constitutive and imperative for their incorporation into collectives and networks. Thus, rather than thinking of them as produced in relations, we may think of them as what makes relations possible" (ibid.: 157). According to Olsen, this approach allows one to notice the characteristics of things. The monitor stand is the collective of plastic and metal parts when one of the metal parts—the spring—might release suddenly and cause an injury. It is the property of the spring related to the hard-to-disassemble quality of the monitor stand that led to the avoidance of the perfect sorting.

Olsen's conception resembles the objectification process described by Daniel Miller (2005). Building upon Hegel, Miller argues that we cannot understand who we are. The process of objectification means that we can recognize ourselves only "by looking in a material mirror, which is the historical world created by those who lived before us. This world confronts us as material culture and continues to evolve through us" (ibid.: 8). Miller's reflection on materiality proceeds from the long-lasting discussion and endeavour to transcend the duality of subjects and objects. Thus, it enables me to involve humans in Olsen's collectives not as opposites to materials but as an integral part of the collective. At EREDA, the disassembly workers used screwdrivers, metal shears, hammers, and other tools in their everyday practices to separate one material from another, thus changing the form, use, category and value of things. The familiar pieces of monitors and televisions required routine sequences of steps that led to separation. Workers, tools, electronics, and materials met together in

a collective that provoked the actions of disassembly and classification. The character of these actions unfolded in close relation to the properties of the things and qualities of the people involved, in what I call human-material entanglement.

The example of the monitor stand mentioned above quite nicely shows the dependency of disassembly and classification on the properties of materials. In the first step, the monitor stand was separated from the monitor. It might have been joined either with screws or by a simple mechanical fastening that could be unfastened without any specific tools. The nature and properties of a particular monitor stand determine the manner of disassembly. One piece might be disassembled without problems into essential parts, while another piece of the same type might cause difficulties, leading to incomplete separation and imperfect sorting. The difficulty is mainly due to the properties of two different materials, iron and aluminium. Iron is solid, while aluminium is softer; therefore, iron screws settle into aluminium firmly, and often before one manages to get them out, the screwheads are destroyed to the extent that it is not possible to remove them anymore. In that case, instead of nicely separated materials, there is an indeterminate piece whose classification is equivocal.

Knowing materials was crucial in both workspaces. The distinct nature of work gave rise to the specific kinds of value that accompanied how the materials were known. In the upper workshop, the employees worked for a longer time and often recalled the previous foreman. Their working habits were based on their long-term experience of handling electronic waste. Their experience allowed the workers to consider multiple factors impinging on the disassembly process. These factors included endeavours not to lose value, regard for one's safety, and sorting in pursuit of material purity. The workers' experience, in conjunction with their effort not to waste time or value and their yearning for the past connected to the previous proficient foreman, interfered in their decision-making. I understand nostalgia as sentimental value that covers relations associated with emotions. In the portable building, the workers dealt with heterogeneous materials that were often not easy to be unambiguously sorted. This character contributed to the moral considerations of further use of materials. The extended imaginaries and moral engagement in the future of handled materials directed the ways of classification. It means that the moral value realized in the conscious and responsible handling of things and the effort to achieve justice, and the sentimental value performed

in the nostalgia for the past linked with the previous foreman, affect and form the worker's knowing of materials, his entanglement with materials, and, consequently, the working procedure.

Summary

In this chapter, I analysed the relation between knowing waste and the various kinds of value in which waste management occurs. When I pursued the transformation of value and material properties, I noticed that despite the representation of e-waste as a resource of rare metals and as an environmental risk (Ciocoiu and Târţiu 2012) and thus anticipated rigid procedure of recycling, the practices of workers demonstrated a certain extent of freedom, especially in their classification processes. Deeper insight into the management of e-waste in Czechia led me to disentangle specific registers of value. Inspired by Gille's concept of waste regime (2007: 34), I focused on the broader context of e-waste processing. I identified the registers of value that shape knowledge of e-waste and, subsequently, practices linked with e-waste.

"Rather than finding 'waste', we kept finding 'value'," noted Josh Lepawsky and Charles Mather (2011: 247), based on their endeavour to follow e-waste in Canada and Bangladesh. They dealt with the ambiguous emergence of value and waste with the help of a methodological and conceptual approach based on boundaries and edges. Another approach to the ambiguous nature of waste is articulated by Jennifer Gabrys (2013: 16), who indicates that "[t]he ambiguity of determining when waste definitively becomes waste points to its role as a dynamic category. Waste oscillates in relation to ordering systems and structures of value." Just as waste is a dynamic category, the classification process does not remain stable. Instead, it adapts, changes, and leads to various outcomes. I call this dynamic classification freedom.

Classification freedom at EREDA has different forms depending on the working environment. I deal with two main workspaces: the sorting line in the portable building and the upper workshop, where work differs in material composition, working procedure, strenuousness, and health risks. The different conditions result in diverse forms of classificatory freedom. First, it concerns the freedom to sort shredded or disassembled materials. Second, the discarded devices in their entirety are freely assessed and sometimes appropriated. In both cases, freeness in classification is

accompanied and affected by experience, moral value, sentimental value, and trophy value. Still, these kinds of value do not lead to freedom itself. Instead, they represent specific by-products of loosened practices. Classification freedom also represents the way how people with disabilities bring their biographies and attitudes into the sorting process. They resist being alienated from the objects of their work and find relations not only with objects but also with people who are presumed beyond the objects, as I will further show in the following chapter.

The research on e-waste recycling in Czechia shows how classification freedom would not be possible without the stabilising effect of the specific registers of value materialised in the network and practices of several actors. The registers of value in which e-waste recycling occurs are characterised by environmental, social, political, and economic orientations. E-waste management in Czechia is linked with care for the environment and people with disabilities. The producers subsidise the care in compliance with Extended Producer Responsibility as defined in the WEEE Directive, and the state provides a subsidy emphasising its social role. The policy approach of EPR facilitates the control of the proper treatment of e-waste and resulting materials. The collective-system organisations provide the control that assumes producers' responsibility for end-of-life products. On the one hand, testing the effectiveness of processing and surveillance over the sale of materials does not prevent workers from classifying freely. On the other hand, the effects of classification freedom probably are not so significant that the collective-system organisation would have to negotiate it. It shows that control, anchoring, and stabilisation in one sphere can lead to freedom and loosening in other spheres.

3. The Morality of Stealing

When I disassembled discarded LCD televisions and monitors for the first time, one part called the LCD module, captured my attention. The LCD module can serve as a mirror as it reflects the objects in front of it. I had just learned how to safely disassemble all parts of a television when Nikola handed me one such "mirror". She asked me whether I wanted it in my flat. I was unsure how to react because it did not appear as an aesthetically appealing object. Nikola suggested that I could also put it on my working desk. I objected that it seemed silly. However, Nikola invited me to look at my "neighbours". Two sixty-year-old men working next to me even had three of these "mirrors" in front of them each. When I eventually accepted it, Nikola told me to leave it in my locker for now because we could find an even bigger and clearer one.

I was startled that the mere function of a mirror attracted my co-workers to the part of the LCD television to the extent that they took it away. It led me to the question: Why are the workers stealing e-waste? This question may seem easy to answer because e-waste materials are resources right in front of workers and thus vulnerable to being taken. However, I would like to delve deeper in an effort to explore the answer.
I believe this question has two interconnected layers. First, it relates to stealing as a morally and ethically[29] questionable activity. Taking things away from the company without relevant documents was forbidden under the amendment to the job contract. Still, taking things was not exceptional in the workplace, and the workers took the risk of being punished. Second, it relates to e-waste as a broad category of things that are discarded and unwanted and, at the same time, excite interest as the precious source of rare materials in the global market (Alexander and Reno 2012a; Ciocoiu and Târţiu 2012; Lepawsky 2018). I look at the e-waste global market from the perspective of the most invisible, the workers who disassemble electronics that others found fit for the scrap heap. E-waste as a subject of profitable trade does not explain why workers at EREDA find e-waste attractive.

[29] When I am not directly referring to some author, I use moral and ethical interchangeably and do not distinguish them. I am inspired by the argumentations of Fassin (2015: 6) and Lambek (2010: 9).

Stealing is commonly perceived as unethical or immoral in the context of the Christian tradition that dominates in Central Europe, even if rather implicitly.[30] According to Czech law, stealing is illegal, and at EREDA, it is unacceptable under the amendment to the job contract. Veena Das (2012: 136) mentions that the approach of ordinary ethics allows for considering "the unethical as growing within the forms of life that people inhabit." When striving to see "how forms of life grow particular dispositions" (ibid.: 136), it is easy to omit how people deal with their actions that they understand as unethical. Although theft is considered unethical from the perspective of the law and the company's rules, stealing functional and usable things whose lives would be ended otherwise might also be approached as thrift. Multiple activities associated with thrift include but are not limited to hard work, self-discipline, saving, and storing (Alexander and Sosna 2022: 4). Catherine Alexander and Daniel Sosna deal with the multilayeredness of thrift that may be considered a virtue and rational economic behaviour in one context and condemned as an obstacle to market development in another. They highlight three possible ways in which thrift might be understood. In the context of the practices of EREDA workers, the most relevant seems to be the broadest way of understanding when thrift might be approached broadly as "a rational mechanism for ensuring security." It may be realised as household saving, but also as "a sharing economy or gift exchange system that maintains social relations" (ibid.: 17). Tending to this last approach, I look at a form of thrift that extends beyond the household and community to the network of humans (particularly those on the other side of the production-consumer-disposal chain – the assemblers) and things. Thrift, in this case, does not refer to "the virtue of frugality as minimal expense" that would be "located in the domestic, private sphere" (Alexander and Sosna 2022: 9). Instead, it rather designates the effort not to lose value (Sosna 2022: 179–80).

Thanks to its indeterminate character (Reno 2016: 14)—"anything could be in the waste"— waste arouses curiosity and interest. The accumulations of wasted materials in landfills, dumps, scrapyards, or collection yards attract people who hope to find a treasure (Reno 2009). The landfill workers who shared their desires and hopes with Sosna (2022: 172) relied on the landfill as a way to make the unfavourable

[30] In contrast to the neighbouring countries—Austria, Slovakia, and Poland—that remained significantly religious, Czechia is considered a rather atheistic country. (e.g. Lužný and Navrátilová 2001; Havlicek 2021; Pew Research Center 2017; Václavík, Hamplová, and Nešpor 2018; Váně and Štípková 2013)

prospect of the future better. To look at the waste differently requires a transformation that Kathleen Millar describes at *catadores*, the scavengers at the dump in Rio de Janeiro. The transformation from shock and disgust to amazement or even excitement denotes the start of recognising the dump "not as an overwhelming mountain of garbage but as a rich assemblage of things" (Millar 2018: 58). Joshua Reno, who dealt with the relations in which life at the sanitary landfill in the United States occurred and "explored the waste disposal as a social relationship" (2016: 2), understands by scavenging "the practice of recovering what would otherwise be disposed of, in order to reuse it" (ibid.: 98–99). Reno brings attention to the fact that waste is often privatised and inaccessible, making scavenging difficult. In contrast to the "normative capitalist exchange, […] scavenging involves more concrete and serendipitous enactments of human and material potential" (Reno 2016: 100). Reno (ibid.: 99) and Patrick O'Hare (2022: 169) then mention the question of ownership and lack of understanding to why shouldn't people take what somebody threw away. O'Hare further suggests that abandoned and wasted things should become part of urban waste commons. Similarly, there are cases of scavenging and appropriation at the e-waste dumps (Kirby 2019; Oteng-Ababio 2012). These studies focus primarily on the embeddedness of scavenging in the broader economic and political contexts. Instead, I bring attention to the specific human-material entanglement in a certified e-waste processing company. This entanglement is supported by classification freedom, which refers to looseness in the sorting and classification practices of workers and is described in the previous chapter.

In the pursuit of understanding stealing and its moral and ethical implications in the context of the e-waste processing company, I turn to Jarett Zigon's theory of moral and ethical assemblages. Zigon (2014b: 762) argues that morality and ethics arise from ontological conditions for dwelling in the world. He focuses on the local and global assemblages in which the moral occurs. The assemblage includes three aspects of morality and "a unique set of ethical practices that emerge out of this localised assemblage of various moralities" (2010: 6). Zigon approaches morality as institutionally or publicly formulated discourses and embodied individual dispositions that allow comfortable dwelling in one's world. Ethics "is the process that is aimed not at the good but rather aimed at cultivating this existential comfort in and between the ranges of influence of these various moralities" (2010: 5). He further argues that ethics

manifest itself in the moments of moral breakdown when one must reflect on her moral and ethical beliefs. Contrary to Zigon's conception, I elaborate on how the moral and ethical negotiations are mobilised in everyday practices, as Webb Keane and Veena Das, the proponents of everyday, and ordinary ethics, highlight in their work. Following these approaches, I focus on how the moral and ethical become materialised in the practices related to discarded electronics. I unfold the debate on how and through what moral and ethical beliefs are shaped and further performed in the next section of this chapter.

In the case of stealing e-waste, I want to show how the workers deal with the feeling of inappropriateness in their everyday choices about the materials—the guilty conscience of unethical doing. Zigon delineates ethics as the process that follows the moral breakdown when equilibrium or attunement, in his terms, is disturbed. Instead, I show that ethics occurs at the moment "in-between" when it is mobilised to maintain equilibrium and balance. However, it is the moment that follows the previous ethical decisions. The workers' feeling of inappropriateness becomes more pressing, especially when meeting a strange other. They strive to mitigate the guilty conscience, and they do so by the following means: concealment, justification, solidarity, gift-giving and sharing. Ethics is continuously strengthened by these specific acts that contribute to maintaining equilibrium and achieving balance on the individual level, or, it is possible to say, attunement within the moral and ethical assemblage characterised by two rather contrasting discourses. One considers stealing illegal, and another sees it as a virtuous act.

In this chapter, I aim to look at how the workers consider their lives within the context of their activities at EREDA. They strive to fulfil the good life and, in order to do so, try to achieve moral and ethical balance. In situations related to stealing in the e-waste processing company, I want to show the workers' everyday moral and ethical decision-making that promotes worker solidarity. Their effort not to lose value represents one form of thriftiness that considers the potential of things and the work as an expended energy of the people.

The following sections introduce the practices related to stealing: concealment, justification, gift-giving, and sharing. Concealment delineates the activity that is perceived as unauthorised. The practices of concealment show that workers are aware of

their unethical behaviour. Justification represents the way how to interpret one's behaviour morally. Drawing upon Strathern, it further reflects how stealing can include multiple interpretations. Gift-giving is enacted to promote the relation and show sympathy. I don't know of any workers selling stolen things. Instead, these things became the object of non-monetary exchanges, such as gift-giving. I believe it relates to conceptualising them as waste, apart from respecting the company management's order. At the same moment, gift-giving represents the way to resist alienation from the products of one's labour and decide freely over their destiny. Sharing is the materialisation of broader solidarity networks within the workshops and the company. Except for reuse and gift-giving, it represents another way to prolong a device's life. As such, it forms the ideal yet overlooked trajectory of things praised by the circular economy advocates. Thus, I look at why the sharing in e-waste processing companies does not comply with the ideals of circular economy and what the differences in moral and ethical assumptions are.

Moral and ethical negotiations of attunement

To understand the worker's moral and ethical actions as relating to the act of stealing, I look closer at Jarrett Zigon's understanding of morality and ethics with an emphasis on what he calls "attunement". I consider Zigon's approach inspirational in conceptualising the entangled aspects of morality and identifying the ethical moments. However, I find it insufficient to describe an individual's everyday dynamics of moral and ethical negotiations. It leads me to connect his conception with the apparently disparate theory of ordinary ethics presented by Veena Das. I try to set the background for understanding stealing in the context of waste work as a particular moral and ethical action. I follow the scholars who examine the moral and ethical negotiations regarding waste taking (Sosna 2023, 2022; Millar 2018; Barnard 2016), and I want to contribute to this scholarship by highlighting the decision-making and behaviour that accompanies stealing. I seek to capture the everyday moral and ethical coping with the act of stealing, which I understand to be in a constant process of redefinition and specification in an attempt to achieve attunement. Imagining an individual life as a sequence of moral and ethical acts relating to established moral and ethical beliefs, I recognise thinking as Zigon understands it as the moment when one relates morally and ethically to herself and the world in pursuit of attunement. Unlike Zigon, I approach it as occurring not

only in the moments of moral breakdown but on a different scale on a daily level and not necessarily affecting the individual ethical life completely.

I draw upon Zigon's conception of moral and ethical assemblage. He distinguishes three aspects of the assemblage: formal institutional, and public discourse, and embodied morality. Inspired by Mauss' conception of habitus, Zigon (2010: 8) describes embodied morality as "unreflective and unreflexive dispositions of everyday social life attained over a lifetime of what he called socially performed techniques." The ethical subject is then not a human being but the assemblage itself. Zigon reckons the individual's moral and ethical reflection only in the moments of moral breakdown. Such a trigger for moral breakdown could have been the COVID-19 pandemic (Zigon and Throop 2022). Moral breakdown "occurs when some event or person intrudes into the everyday life of a person and forces them to consciously reflect upon the appropriate ethical response (be it words, silence, action or non-action). Once one has experienced this moral breakdown, they work on themselves by utilising certain ethical tactics not only to return to the unreflective and unreflexive disposition of morality, but in so doing to create a new moral dispositional self" (Zigon 2010: 9). By contrast, Webb Keane (2019: 10) states that a human becomes aware of her ethical approaches in social interactions. Social relations then provoke the creation of rational behaviour norms and encourage understanding of one's role in the world. Both Das (2012) and Keane mention the essential role of sociality and social interaction in individual moral and ethical reflections.

Zigon suggests perceiving an individual not as a rational being but as an affective one. The affective being is a relational being whose nature changes based on the crucial relation (Zigon 2014a: 21). Inspired by Martin Heidegger, Zigon speaks specifically about the human being as Da-sein, emphasising its "there-ness". "Da-sein as an assembled relational-being is essentially a being of potentiality and possibility and is thus the basis for what is called difference and plurality" (ibid.: 22). Da-sein forms an ontological condition of attunement. "This attunement manifests itself as the potentiality to become engaged with and become entangled in diverse and particular relationships that makes possible the vast diversity of ways of living we find in the social world" (ibid.). In the ontological sense, attunement represents the fundamental capacity for

relations to assemble. Zigon (ibid.) then suggests that "attuned-entanglement is an ontological condition for morally being-in-the-world."

Zigon's inspiration from Heidegger is criticised by James Laidlaw (2018: 180), who urges caution against the risk of authoritarianism. Laidlaw opposes Zigon's idea of the moral life as defined by "a specific and singular ideal," where the principal risk is that it is "corrigible". When comparing this approach to ordinary ethics, Laidlaw (ibid.: 183) mentions: "While Lambek emphasises that human action pervasively requires the exercise of practical reason, and Das similarly insists that the habitual and everyday are where ethical thinking is most importantly located, the absence of thought is precisely what for Zigon characterises moral life in a state of equilibrium: everyday morality on his account is the unconscious following of rules, and conforming to standards and expectations without even being aware that this is what one is doing, […]." Although Laidlaw (ibid.: 180) does not assume that ethical agency is formed only by "self-interpretation and reflective self-formation," he argues that it forms its part. Thus, he declines Zigon's assumption that the agency for ethical action is located in the moral and ethical assemblage.

Zigon (2022) elaborates on his conception of embodied morality and moral breakdown in analysing truth and thinking in what could be read as an implicit reaction to Laidlaw and similar critiques. He builds upon Hannah Arendt, who adopts a similar stand as Martin Heidegger and Ludwig Wittgenstein that most of our everyday life is done without thinking. "Phenomenologically, much of our everyday life is lived without thought, and embodied habit—or, what might better be called habitus or an active disposition—better describes how it is that we are in our worlds" (ibid.: 94). Zigon emphasises the relational aspect of attunement, and thinking as highlighting this relationality. "Thinking, then—as that which one does in ethical moments of moral breakdown—pulls us ever more tightly out of ourselves and into the world. We are perhaps most intensely relational when we think" (ibid.: 97). In the same way as thinking, Zigon assumes that moral and ethical reflection represents a relatively rare moment in our everyday lives.

In contrast to Zigon's phenomenological background, Veena Das builds her arguments on the philosophical writings of John L. Austin and Stanley Cavell, both proponents of ordinary language philosophy. Das (2012: 134) approaches ethics as

a dimension of everyday life that shapes individuals as moral subjects. The individual is then perceived as embedded in the collective life and not through her own intentionality or individual "agency" (Das 2012: 140). An individual acknowledges the moral and ethical values that are socially enacted as essential only when she manages to integrate them into her everyday life. I see a few similarities in Zigon's and Das's approaches to understanding habitual behaviour that is not reflected. Unlike Zigon, Das further mentions that such moral and ethical behaviour cultivates the sensibility to other aspects of life. Therefore, she considers it crucial to look at the ways of everyday life and its effect on the concrete ethical dispositions (Das 2012: 136).

Although both authors proceed from different theoretical backgrounds, they acknowledge a moral and ethical action that is habitual, unreflected, and integrated into daily life. Zigon emphasises the relationality to the world and oneself as the condition for attunement. The attunement is disturbed at moments of moral breakdown when one reconsiders her moral and ethical thoughts. Unlike Zigon, I assume that, except for the moral breakdowns, the individual is pushed to negotiate their attitude towards the moral and ethical standards they have already accepted at moments that are more ordinary. These moments occur almost daily in the different spheres of human life and constitute thus the everyday life experience that shapes a person as a moral being. Through such daily negotiations, the attunement is struggled to be achieved.

The moral and ethical assemblage of the e-waste processing company makes theft possible because the waste materials are seen as belonging to nobody (cf. O'Hare 2022), waste work is insufficiently valued from the worker's perspective, and there is bodily contact with the materials determined to be destroyed. Moreover, two disparate discourses form a moral and ethical assemblage in this case. On the one hand, the law and company's rules postulate stealing as an illegal, unauthorised, and, therefore, unethical act. On the other hand, the "waste hierarchy" set by the Waste Framework Directive[31] of the European Union places reuse above recycling. Such background makes it harder how to navigate one's ethical decisions in daily life. Dealing with the stolen objects shows that the workers strive for attunement, to balance the unethical act

[31] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

of stealing with the salvaging perceived as ethical, and compensating activities such as concealment, justification, gift-giving, and sharing.

Concealment

When Nikola offered me the "mirror", I interpreted it as a sign that she counted me in. I was delighted by her openness and kindness to me. Therefore, I was even more surprised that she and other women became aloof to me several weeks later. It happened when I returned to them after a few days I had spent in a different workspace. I greeted them joyfully, but nobody responded the same way. Even Romana, who worked next to me and was usually very talkative, became reserved and was replying curtly. Then I saw her whispering something to Nikola. I understood that something was wrong. Suddenly, their friendship and their affection for me was gone. I did not know why. I felt miserable.

Immersed in the thoughts about the cause of the behaviour change, I focused on disassembling good-looking magnetic wireless chargers still packed in the original packaging. I had to unpack the charger, divide the cables, cut their endings, and separate all the materials piled on my desk. Apparently, these chargers were never used, and it caught my interest. I began to realise what could have caused the change in attitude. I asked Romana if I could take one of the chargers. I was interested in her reaction and hoped it would help me decipher the change in atmosphere. She answered a bit evasively: "It is up to you." Then she emphasised they would not tell on me because they pull together here. I considered it weird how she stressed this fact. Later, one co-worker came and took some chargers directly from my desk. Probably based on his straightforwardness, Romana explained to me that the other women were afraid I would tell it to the management. I defended myself and said that I would never do that.

I realised that my position was hardly clear to my co-workers. I first visited EREDA in June 2020. I interviewed the chief manager, who showed me all the sites of the workplace and explained the disassembly process. I asked him whether it would be possible to work in the company and do my ethnographic research there, and eventually, he agreed. On the one hand, I felt that thanks to his goodwill, I could do my research in the company, and I felt obliged to him. On the other hand, in the daily interactions, I communicated only with my co-workers, who were aware of my relation to the chief

manager. The workers knew that I was in the company for other reasons and that I had some special deal with the chief manager. It took me some effort to persuade them that I was not a spy who would snitch on them. My entanglement in the web of various obligations and loyalties (Fair et al. 2023) was ambiguous for them. I was a strange other to which the moral and ethical positions were negotiated specifically (Keane 2019: 11).

When contemplating why the workers were hiding from me taking the chargers, it remained unclear why the ambiguity of my position did not prevent Nikola from offering me the "mirror". The change occurred with the different kinds of e-waste we dealt with. It seems that the shift in behaviour emerged from the difference in material properties and the anticipated exchange value of things. Some were considered less problematic to take than others. The chargers and many other products we had to unpack in the upper workshop were delivered from a large international electronics manufacturer. Based on the certification EREDA holds, the manufacturer chose it to dispose of its new and never used products. It might be deduced that the manufacturer also hoped for increased confidentiality apart from the proper disassembly. Among workers in the upper workshop, it became clear that whenever the truck came from one specific Czech town, where the manufacturer's storehouses were located, it would contain some potentially interesting things. These things raised desire and concern linked with the effort to conceal.

One employee bluntly described the difference between e-waste objects when I tried to clarify my position in the company. We ate lunch when I explained to him that every day, I come home and write down everything I experienced and what the people told me, including him. Assuring him that my aim was not to harm anybody, I mentioned that the informal actions seemed particularly interesting. I alluded to the hoodies that appeared in one hall, and some of the workers used the opportunity to take some of them. The employee started to get nervous and told me it could be a mess and I should not write about it. He added that I can write about the old things that don't pay off for the manufacturer to sell. Therefore, they give them for disposal. Concerning the hoodies, it could be bad. The employee was afraid that the suppliers or, more precisely, clients who provide the things for removal could find out that the items are reused. The

employee told me: “Look, it is not worth underselling the products. Therefore, they prefer to dispose of it.”

The employee expressed more significant concerns about EREDA’s good reputation towards their clients than about the findings of his pilfering by EREDA’s management. It was a different way of “pulling together.” The concealment of the activities that the company itself would primarily see as violating its rules was paradoxically also done in the company’s interest. The workers repeatedly warned me that the contractual partners must not learn about these takeaways. Such a collaborative way of mutual effort could be understood in terms of solidarity when more actors strive for mutual good against the common enemy, or in this case, a strange other. The employee who described the situation above did not have a problem sharing the knowledge of taking things with me. Instead, he was afraid that the information could get further, eventually to the EREDA’s contractual partners, who relied on EREDA to dispose of their products completely. The fact that these products were never used or sold only stressed how confidential this task was.

On the one hand, the charger was of considerable financial value, which contributed to its concealment in front of strange others, such as me as a researcher. On the other hand, the charger was the subject of the essential and intimate relationship between the EREDA and its client. The EREDA’s workers were aware of the essentiality of such a business relationship. Therefore, they were more cautious in concealing the taking of these discarded products. The practices of hiding then further enacted solidarities among the workers. Solidarity, like care (Atkinson-Graham et al. 2015; Mol, Moser, and Pols 2010; Puig de la Bellacasa 2011), is never unambiguously positive. The decision is always made on who is included and excluded from the solidarity. At EREDA, not all workers were involved in taking things away. Some were excluded rather unintentionally as these workers were not socialising with those who had information or access to things. Others were excluded from the group knowledge due to their inability to conceal carefully. The relations of exclusion will be elaborated in the section on sharing, where these practices became more apparent.

Concealment represented one way of dealing with the inappropriateness of the act of stealing. The character of concealment disclosed what material aspects of the things and relations among people became significant. First, the things and their various

material aspects were either desired and increased more careful treatment regarding the concealment, or they represented the common items that were more broadly shared. Second, as a consequence of stealing, the workers' solidarity was encouraged through participation in the same activities. On the one hand, the solidarity sometimes stretched even to the company's management. On the other hand, this solidarity excluded those who were unable to participate in taking things in the same way or who could pose a risk of revelation. Concealment represented a strong social act, showing where the ties were built and where they were missing and revealing the different types of human-material entanglement based on the perception of materials. In the following section, the concealment will be complemented by the justifications accompanying these practices.

Justification

Disassembling mostly discarded televisions and computers in the upper workshop, I took the big PC monitor as the last one I planned to dismantle that day. It was wrapped in several cables. I cut one part straight off. Only a few seconds later, I started to regret my quick action. I discovered that the cables led to the separable speaker that could be useful, and I could have taken it. Later, I told this to Romana and laughed that, on the other hand I couldn't pilfer the whole company. Romana told me not to be so loud. She continued that I should ask Eva the following day because she had some speakers in her storage. Romana then talked about how she discussed the acts that could be described as thefts with her religious friend. The friend explained to Romana: "This is not a sin." By contrast, the friend meant that Romana acts right when things can be used again and do not need to be thrown away.

Similarly to landfill workers who salvaged and kept the things found at the landfill, as Sosna (2022: 171) describes, EREDA workers did not use the word *kradení* (stealing) and its derivates. Instead, they tended to refer to their activities as *odnášení* or *braní* (taking away)[32]. The latter has weaker negative connotations compared to the first term. Being aware of doing something wrong, the workers searched for conciliatory labels for their activities. Although the workers did not necessarily talk about stealing and did not define their actions in these terms, concealing things made it clear that they

[32] The similar logic applies to the term *kombinowanie* used by villagers in Highland Poland to designate activities that are rather illegal or their legality is ambiguous. (Makovicky 2018)

were aware of the prohibition. In many cases, the practice of taking something away from the company involved considering the second use of things (for example, plastic bags, which Jakub collected to put sawdust into them). They tended to find a use for these things. The financial value they assigned to them did not play a significant role. The idea of the suitable use for the workers' purposes was important. They did not steal the expensive materials because they could benefit from them financially. They were interested in the creative aspects of the taking.

In understanding these actions in the broader context without losing sight of the workers' perspective, I am inspired by Marilyn Strathern (2010). In her chapter on anthropological reasoning and the effect of a concept in the context of other concepts, she juxtaposes stealing, sharing, and borrowing. On the examples from the Micronesian board school Xavier, the British free democratic school Summerhill, and the distribution of meat at Yukaghir in Siberia, she shows how not the essence but the limits of the concept are crucial. The limits of the concepts allow for re-descriptions. She draws upon Alberto Corsín Jiménez and Rane Willerslev (2007), who elaborate on displacement and its role in anthropological descriptions and re-descriptions. "At its limit a concept forces a re-description of everything it has delimited up to then, for it is here that 'concepts capture their own shadow and become something other than what they are' (Jiménez and Willerslev 2007: 538)" (Strathern 2010: 32). When Strathern describes boys' practices at the Xavier school, usually referred to as "Xavier borrowing," she draws attention to the opposing positions of pupils and teachers.

> "I infer that teachers used a concept of property to hold fast to the meanings that things carried, where indignity is compounded by failure to recognise proprietorship. Whether or not they used a property-derived vocabulary, students may well have added a different indignity altogether, namely the kind of effect one can have on persons through restricting their capacity to be effective in relationships. Stealing in the first case is an assault on property rights and the proprietary relationships upon which (in this view) social order rests; stealing in the second is designed to injure, to create a victim and, however mild, constitutes an act of aggression." (Strathern 2010: 30)

Similarly, workers' practices can be described as stealing, thus emphasising their unethical character, the appropriation of somebody else's property, and the effort to harm or enrich oneself. The "shadow" (Jiménez and Willerslev 2007: 538) of stealing becomes a taking away that offers a more acceptable label, only slightly indicating that what is taken is not mine. At the limits of these two terms, what comes as pressing is the question of ownership and the awareness of the ownership. This question seems to have a specific meaning as soon as one realises that the subject of ownership here is waste. Officially, there can be two types of ownership of waste at EREDA. Either it is the property of EREDA or the collective system responsible for the disassembly. These two kinds of ownership then shed a different light on the previously mentioned situations. The question then might be not so much about ownership as about responsibility.

When I had an interview with EREDA's chief manager, I confronted him with the fact that the employees were taking things from the company. To my surprise, he replied that it was good so long as they didn't sell it. This means that things do not become included in the market and market logic. He mentioned that it was great when the life of things was prolonged. The fact that the e-waste was not exclusively the property of EREDA made the chief manager's attitude comprehensible. Further, he also mentioned that earlier, he and his colleagues from the administrative offices took some devices they could have used in the offices. For example, they found a jug kettle. However, with time, they discovered it was not worth it because the devices did not function for long. Thus, it was easier to buy a new one.

When handling e-waste on a daily basis, the workers approached it as the company's property or as belonging to nobody since it was waste—something that its owner refused. However, their ways of justification presupposed that they were rather aware of the ownership that was violated by their behaviour. The workers did not necessarily understand the stealing as unethical but as illegal or unauthorised. The guilty conscience led them to search for ways to make it acceptable. As Romana's friend noted and Romana adopted, taking things away was not a sin. It was not unethical. Instead, it was ethical to prolong the life of the electronics. Preserving the value was considerate not only to the thing but also to the work of the assemblers. Romana once expressed regret for the wasted time and energy of those who assembled the printers, which were never used and had to be disassembled despite being functional. Probably then, the

limits between stealing and prolonging electronics' life were where the limit became significant. That is when the moral and ethical were re-described.

Romana's justification, however, leads us to the duality of moral and ethical as perceived in Christianity which differs between right and wrong. When Veena Das (2012: 136) suggests considering unethical as growing from the form of life people conduct, she highlights that the negotiation of ethical and unethical is not the key point, nor to look at the reality objectively from the outside, but it is about the looking at the forms of life and its impact on the concrete dispositions. Similarly, stealing cannot be evaluated in the ethical-unethical axis. In the case of practices at EREDA, this duality causes uncertainty in workers on how to approach their behaviour ethically. The salvaging of things is considered ethical, but the question is how to deal with the unclear ownership of waste. The ambiguity in understanding the moral and ethical dimensions of the acts of stealing in the context of the e-waste processing company leads the workers to balance. Besides concealment and justification, they applied ways of exchange that avoided financial compensation, such as gift-giving and sharing. These will be presented in the following two sections.

Gift-giving

At the beginning of October 2020, only two months after my start at EREDA, I got the opportunity to participate in a working activity that involved operating a specialised machine. I decided not to describe the nature of that activity more precisely because it could threaten the position of the workers who made it possible. The reason was that only the trained workers could perform this task for obvious safety reasons. Therefore, I considered it something special. I felt obliged to those two workers, thanks to whom I was allowed to try such an activity. The next week, I brought them a box of chocolates. One of them, Luboš, a kind man in his fifties, refused to accept it. Only after I pointed out that I had given the same box of chocolates to the other worker Luboš took it. However, he added that he owned me one.

Two days later, it was only a few minutes before the shift's end when Luboš came to my working table. After a short conversation, he leaned and asked in a low voice whether I wanted a selfie stick. I said no. So, he asked again quietly whether I wished to have wireless headphones. I hesitated for a while and then said I probably

would. He wondered whether I had something where to hide them. I said I had the cloth bag. Simultaneously, I objected because I didn't want to take his things. He reacted that they were in the way in his workspace anyway. Then he left. When he came back, his work jacket bulged in the abdomen. I could not help smiling. Before taking the headphones out, he explained how they work and how to control them. He leaned over the desk when talking and showed me blue-white headphones hidden in his jacket. Then he took them out, and I promptly hid them in my cloth bag.

The headphones were not the last and only gift I got from him. In the following weeks, he brought me a smartwatch and persuaded me about its quality. Then he gave me the wireless earphones, which I found very useful until I lost one of them. Luboš was not the only person who used the found things as objects of gift-giving. For example, I was offered quite regularly a gift from Tomáš. Tomáš was 48 years old, but everybody called him by the diminutive of his name (Tomášek). This practice, criticised by many progressive social workers as a part of infantilisation (e.g. Shakespeare 2000), was given by the mental impairment Tomáš had. I believe he liked me because he came to my table almost every day, asking me about my day and offering me batteries. The discarded batteries were stored in a plastic box under the roof in the yard. They were freely accessible because there was a danger of igniting. Tomáš swept and kept the yard clean. Thus, he had easy access to the batteries and used them to maintain a good relationship.

The things were not given only within the company. In our conversation over the taken things, Romana mentioned that certain things represented nice gifts that would otherwise have cost a lot of money. She meant precisely the never-used things the manufacturers disposed of because these products had lost their financial value. It was also the common practice of other workers who used the obtained devices as gifts to their family members or friends. Surprisingly, I didn't come across any case where somebody would sell the things taken from the company. Romana and the company's chief manager explained to me that the management overlooked these practices as far as the workers did not sell them.

Looking for interesting objects in the e-waste processing company reminds me of shopping in a thrift shop. When rummaging through the piles of clothes and shelves full of various objects, it is impossible to find the concrete thing. It means that the

seeker doesn't exactly know what she is searching for but enjoys the process of searching itself. Similarly, the initial incentive for the workers in the e-waste processing facility is to find something valuable in the mass of waste that does not necessarily respond to the seeker's needs. The lure of discovery is powerful. As Sosna (2022: 171) puts it: "Scavenging, however, is not just about the things being rescued, but also about the pleasure of the activity itself." It is connected to the individualisation of things—the ability to give them value by picking them up. Individualisation becomes a crucial part of salvaging. The moral and ethical is realised in care, which plays a significant role in managing discarded things and decides what to salvage and what to dispose of.[33]

For the workers, individualisation was also one way of human entanglement with materials to deal with the alienation from the results of their work. Instead of being able to see possible economic outcomes and decide about the exchange value, they were unaware of the prices of sorted materials. They were alienated from the post-sorting afterlives of the materials. However, they created specific relations to the objects they worked with, and in these relations of individualisation and gift-giving, they tended to resist alienation. In Marx's sense, alienation involves two processes in capitalist value production. First, the process of objectification lies in the alienation of the workers from the products of their work. Second, the process of exploitation refers to the appropriation of somebody's labour by someone not involved in the production (Narotzky 2018: 32). These conceptual frameworks are, however, challenging to keep in the ethnographic observations. Narotzky (2018: 32–33) argues, "Even in a context dominated by capitalist relations, human labour is never fully disembedded. In fact, by following supply commodity chains, we can observe that the alienable aspect of labour, what makes it exploitable in a particular way, always depends on its inalienable ties to the social environment." The universal acceptance of the objectification is, according to Narotzky (2018: 32) given by the fact that "the framework of individuation and material autonomy of the product are taken for granted." In their daily encounter with electrical and electronic waste, the workers established and developed their ties to the material environment of the company not on the basis of knowledge of post-sorting afterlives but instead on the basis of individualisation and further social involvement.

[33] At this point, I am inspired by Christina Schwenkel's comments to the papers in the panel titled Care in the City, Care for the City: Uran Environments and the Politics of Concern at AAA Annual Meeting 2021 in Baltimore, USA.

Marx mentions alienation in the context of factory work, which needs to be disciplined. To achieve sufficient discipline at work, the labour was alienated. "Alienation of labour is no longer only alienation of the products of labour, but alienation of the forms and contents of the work itself" (Marx 1990: 34). Interestingly, Anna Tsing (2013: 24) presupposes that people must learn alienation because it is unnatural. Based on my ethnographic experience, I assume that learning alienation becomes challenging and almost impossible because it opposes the effort to find satisfaction at work. As Sanchez (2020) argues, satisfaction is allowed by the ability to transform. More than anybody else, the workers were in close bodily proximity to the materials that allowed them to be involved in the transformation.

The salvaged object is still perceived as inappropriately gained as its ownership is blurred. This condition does not allow for its transfer into the commodity relations and its selling. Instead, the workers apply other forms of economic exchange. One of them is gift giving, which recasts unethical action into the strengthening of mutuality and sociality. The gift exchange also facilitates elucidating unclear categories of things into familiar exchange circuits. In this case, gift-giving does not create an obligation ("prestation") in the Maussian sense (2016). Instead, it balances the moral and ethical obligation linked with a guilty conscience. It further re-establishes social order and the usual practices of stealing.

In the case of Tomáš, who offered me the batteries, I believe it was his way of showing sympathy and care. Similarly, Anička, one of the co-workers, told me once mysteriously how "a very good man" gave her a radio she used in the workshop. When I asked who gave it to her, she blushed and refused to say. But she admitted that it was somebody from the company. Her emphasis on how good and kind the gift-giver was, disclosed that she perceived it as an act of care. Both concepts, care and gift, are often associated with positive connotations, although they do not need to be innocent (Atkinson-Graham et al. 2015: 739). In the mentioned cases, gift-giving was enacted as a form of care that should promote and strengthen social ties.

Sharing

On the first Monday in September, I and other workers from the sorting line went to the upper workshop because of *fasování* (being issued with). The employees obtained toilet

paper, soap, detergent, and hand cream each month. I liked that the toilet paper, soaps and detergents were put in the locker at the sorting line and then shared. After we signed the document confirming that we got everything, we waited for those who also needed the new gloves. I stood next to Michal, who pointed at the shelf full of small, described boxes (Figure 10). We approached the shelf, and he showed me various cables, chargers, mice, and other small devices inside the boxes. He asked me whether I wanted something. When he pulled out a mouse, I said I could use one, so he gave it to me immediately. Then he gave me one more. He probably would give me some more, but I refused. He showed me gradually what was inside the boxes. There were mostly new, unused things, sometimes still packed in plastic bags. They were sorted in boxes labelled with colloquial titles or illustrations. Michal told me that when I needed something, I could take it here. I asked him whether the management knew about it, but he did not react. I was not sure whether I should conceal it or not. But I preferred to hide both mice under my sweatshirt.

Figure 10 Eva's storage.

Only a few days later, I was transferred to work in the upper workshop. I found out that Eva, one of the women working there, had accumulated the devices and sorted them into the boxes with the help of the other women. She kept creating the storage for five years. The storage consisted of many labelled cardboard boxes partly hidden behind the lockers where workers stored their belongings. I witnessed that she didn't like when somebody took something without asking. The reason was that she wanted to keep it well arranged. Anybody who sought something independently was a risk to the established order. One day, I noticed that the foreman, who had an office just next to this storage, offered a keyboard and cables to one company's partner, probably a haulier. I realised that management was aware of the stored things and used them, too. Still, it seemed that the storage was simultaneously visible and hidden. The storage position in the centre of the upper workshop did not guarantee visibility and availability for everyone.

Most devices or other things we used or had in the workshop were found among the discarded objects. We listened to the radio, which was found among television and computer waste. The shared things were distinguished by their usefulness and practicality. Typically, it regarded radios, speakers, various types of small containers, and decorations. The practices of sharing particularly the working tools, were also standard among the landfill workers with whom Sosna (2022: 170) worked. As Widlok (2016: 75) argues, "Sharing is enabling access to what is valued through a bundle of social practices of responding to demands." The constitutive aspect of sharing is demand that is often unsaid but not violent. What matters is that demand is shared among others. Widlok develops "a theory of sharing that is grounded in the social process of interaction in which the sense of self is extended but in which the sense of self is also limited through the demands of others and the finiteness of human life. The patterns that emerge differ from what Mauss and others have identified for gift-exchange. Instead of the obligations to give, to receive and to return the ethnography of sharing suggests a pattern of opportunities to ask, to respond and to renounce" (Widlok 2016: xvii). Sharing is the materialisation of social ties. Sharing embraces a larger number of humans compared to gift-giving, as discussed in the previous section.

The sharing practices in the e-waste processing company also fit in the current debates on the use of resources on the international level. The current policy of the

European Union is that waste represents a resource. The end of landfilling for recyclable materials in 2030 in Czechia should be accompanied by efforts to promote recycling or, in an ideal case, the reduction of waste-making covered under the label of circular economy. Scholars and environmental activists criticise such efforts as they impose responsibility on individuals instead of prominent industrial players (Liboiron and Lepawsky 2022).

From the perspective of handling things, the abovementioned actions could be understood as following the ideas of the circular economy. The main goal of the circular economy, which represents an ambiguous concept with a lack of clear definition, is by some characterised as "decoupling of natural resource extraction and use from economic output, having increased resource efficiency as a major outcome" (Mavropoulos and Nilsen 2020: xxxiii, cited from Corvellec, Stowell, and Johansson 2022: 2). When the workers salvage the appliance or anything else, they prolong its life, thus contributing to the efficient use of natural resources. Similar practices that manage the resources in a circular way but don't claim themselves in terms of circular economy were described in the edited volume of Patrick O'Hare and Dagna Rams (2024a) and further in O'Hare's comparison between practices of re-use in England and Uruguay (O'Hare 2021). However, I do not want to romanticise the practices of workers. They are not systematic but rather driven by personal interest and desire. Still, I believe that these moments might provide inspiration on how to shift the perspective of the circular economy from a primarily business-oriented issue to one that considers the everyday ethical negotiations of those that mostly remain invisible.

In Czechia, the popularity of the circular economy has increased, particularly in the last few years, with the foundation of two key subjects promoting the ideas of circular economy in practice: INCIEN (Institute of Circular Economy) and Cyrkl. INCIEN is a non-governmental, non-profit organisation founded in 2014. Its motto is "We close the loop", and its goal is to "raise awareness about the concept of circular economy and demonstrate it in the Czech context" (INCIEN 2022).[34] They emphasise that "the circular economy, that lays stress on the lower wasting, in other words on lower mining of primary raw materials and on the prolonging the lives of materials

[34] Original text with original emphasis: „**Institut cirkulární ekonomiky** vznikl s cílem **zvýšit povědomí** o **konceptu cirkulární ekonomiky** a **demonstrovat** jej v **českém kontextu**."

already in the circulation, is from our perspective the only sustainable way for our economy" (INCIEN n.d.).[35] They try to achieve these goals by educating and consulting the companies in Czechia. Except for that, they cooperate with the academic sphere and the state institutions. Cyrkl was founded in 2019, and its founder, Cyril Klepek, labelled it "Tinder for waste" (Černá 2020). The company present itself as "an international technology and consulting company specialising in circular waste management" (Cyrkl n.d.). It operates "Europe's largest digital marketplace for waste and residuals."

Focusing on the circular economy, both companies emphasise particularly the management of already produced waste and its business facets. Thus, it encourages an incomplete understanding of the circular economy as the solution to the final phase of the life of the products. Such vision ignores "the two veins of thought which exemplify current circular economy thinking: industrial ecology and extended product life" (Gregson et al. 2015: 219). These approaches assume the producer-led activities that ensure responsible ways of production and, thus, reduction of by-products and waste. As Gregson et al. (ibid.: 223) observed, the positive examples of such producer-led initiatives were woefully few. Instead, like the mentioned cases of circular economy in Czechia, the interests of the European Union concentrate on the processing, recycling, and reuse of primarily municipal waste. However, as Patrick O'Hare and Dagna Rams (2024b: 3) mention, the reuse and recycling schemes "differ from the circular economy in that they address waste as the effect of production or consumption rather than seek to remake economic systems and industrial design so as to prevent waste." At the same time, the conceptualisations of the circular economy omit the recycling. Thus, the circular economy also becomes a moral economy (Sosna 2023) when "there are right and wrong ways of keeping materials circulating" (Gregson et al. 2015: 224). Gregson et al. describe that global recycling networks have become one such negative example of the wrong way of a circular economy.

When examining the websites of INCIEN and Cyrkl, there seems to be a strong notion of circular economy in Czechia when "…the idea of a perfect circle comes to be taken for reality. These visions of a circular economy are just that: ideals which, at best, describe a few instances where reordering the activity of the firm on these lines makes

[35] Original text: „Právě cirkulární ekonomika, která klade důraz na nižší plýtvání, tedy na nižší těžbu primárních surovin a na prodloužení životnosti materiálů již v oběhu, je z našeho pohledu jedinou udržitelnou cestou pro naši ekonomiku."

business sense." (Gregson et al. 2015: 224) Business intentions mostly drive the activities of the circular economy (O'Hare and Rams 2024b: 11). As Sosna (2024: 155) highlights the fundamental ambiguity of circular economy: on the one hand, it explicitly aspires "to conserve resources", while on the other hand, it implicitly tends "to avoid addressing the primary causes of the crisis which CE is supposed to mitigate, namely the profit motive […] feeding the voracious appetite of neoliberal capitalism." However, the process of circulation might include practices that are not only driven by business logic. Gift-giving and sharing represented the example of the invisible activities that kept the matter in motion. Although these circulations are out of sight and of no interest to most of those involved in promoting the circular economy, their enactments contribute to the creation of other than financial value.

Sharing emerged from the daily encounters with things that showed to be useful and from the efforts to keep them "alive". Sharing then promoted social ties among the workers who were able to express their demands. However, not all workers were invited into this arena where they could have made requests. One of such workers was Václav, with whom I usually travelled back from the company by bike as he lived near my place. Václav was a sixty-year-old man with kind eyes who was a heavy smoker and drank a lot. When I first met him at the shift at the sorting line, I became interested in his life history because of his eyes. But Václav was taciturn and did not reveal much about him. Therefore, we usually talked only a bit and only about the daily routine.

Václav once told me he was having trouble with his phone because the charger was not working. I told him about Eva's storage. It was evident that he had never heard of it. I offered to look for the charger. I did as promised the following day and found it in the storage. This situation made it clear that not everybody could access Eva's storage. It was hidden for some workers. I realised that the social relations established within the company played a crucial role. Václav was quiet and did not join the conversations during the breaks in the shared room for the sorting line. He spent time smoking or just waiting at the sorting line. He alone was invisible to most of the workers. The only time he became visible was when he collapsed after New Year's Eve. I came to EREDA for a one-day visit in January 2021, and my former co-workers informed me that the guy I was biking with was in the hospital due to a collapse. Except for this dismal incident, most workers were unaware of his presence at EREDA. Václav

was avoiding the company of other workers, thus lacking access to the informal sources some other workers had.

A lack of access had also Andrea. Andrea was a woman whose age was difficult to reckon. She had some mental issues, and in the eyes of others, she just appeared crazy. She was very loud in her speech. That was usually why the women in the cloakroom were complaining about her. One day, Nikola and Kristýna recounted that Andrea was rude to one co-worker. Finally, as Nikola with Kristýna emphasised, she got a scolding. The problem was that she stole a little duck that showed the outdoor temperature. The women then continued that one could not leave anything before Andrea. They stressed that she was a kleptomaniac and would have stolen everything. Andrea and Václav were excluded from the common knowledge of sharing practices. For different reasons, they did not become a part of a group. While Václav intentionally avoided it, Andrea would not be included even if she wanted due to her lack of caution and complicated personality. Sharing thus made the incongruences in the group dynamics visible.

Summary

This chapter shows that stealing, although morally and ethically questionable, plays an essential role in social interaction in a given group of people, here EREDA's workers. I elucidate that the workers perceived these activities as inappropriate. Therefore, they applied specific practices related to stealing that should balance the potential unethicality of these acts. The case of the e-waste recycling company embedded in the registers of value as described in the previous chapter, when the waste is apparently nobody's property and the waste company is perceived as a stewarding actor, allows for miscellaneous ways of entangling with those materials and deciding their fate, including their individualisation and appropriation. Such material relations form a specific network that promotes self-defending moral and ethical approaches. These approaches come into light when encountering something new or somebody strange. They are further shaped by the social positions of the workers and by the determination of materials' properties. In some cases, based on the character of the relations with people and materials, the originally stolen things can become the object of gift-giving, thus establishing or strengthening social ties, positions or interests.

The first intuitive answer to the question "Why are people stealing e-waste?" would probably be to benefit financially, as was the case of Sosna's landfill workers who collected scrap metal and dreamed about finding "a real treasure" (2022: 170–72). In the e-waste processing company, the benefits for workers are somewhat different. Ultimately, it lies in the reproduction and maintenance of social relations, particularly in establishing worker solidarity. In general, I would say that the workers steal things from the company because they are happy to find something. It is not done intentionally but is related to the happiness and excitement of discovering (ibid.: 172). Such discovery is accompanied by the ability to think creatively about the use of found things.

The theft of the company's property demonstrates the irresponsibility and immorality of the consumer lifestyle and the capitalist market. In the environment of the e-waste processing company, things are salvaged and create space for social interaction. Through the actions of workers, these objects find appreciation. In the practices of gift-giving, sharing, and collective use, the things are given back their social purpose. Further, social ties benefit from the value of objects, and vice versa, the values of objects come from social ties. In their actions, the workers do not tolerate the destruction of value and use the objects to strengthen the value of the object and the social value of their relations. Their actions represent one of the reactions towards the immorality and moral absurdity of wasting. Stealing in the e-waste processing companies thus proves to be a practice charged with multiple moral and ethical meanings.

4. Cutting responsibility

In 2017, Blesk, the Czech tabloid, published an article titled ‘Cruel death! Boy (†17) from Opava suffocated in an e-waste container. He just wanted to listen to music’ (Blesk 2018). The article reported about the death of a 17-year-old boy who got stuck in a so-called blue container intended for the collection of small e-waste. A witness called paramedics when he noticed legs sticking out of the container. When the firefighters took the boy out of the container, he showed no signs of life. These blue containers had been known to attract people, including children, who sought to extract cables containing copper or other valuable electronics. Getting stuck in such containers was not unusual. In some cases, it resulted in death, most often because the person got stuck in the drop system and the pressure on their chest caused suffocation.

One year before the death of this young boy, the same tabloid published an article: “E-waste containers won’t kill anymore. The company promises a safer type” (Blesk 2017). This article includes a comment by the marketing manager of the collective system organisation that designed the e-waste collection containers, who emphasized that the company was reacting to cases of robbing and damage by improving the security of the entire container and drop system. The blue containers were introduced in 2007 by this collective system organization to facilitate the collection of electronics and shorten citizens’ journeys to the collection yards where various types of waste materials can be disposed of. Since the launch of the containers, the collective system has changed its design several times. The newspaper article emphasizes that the safety of the containers should be guaranteed by the collective system, implying that the deaths of those who broke into them are the responsibility of the collective system and the containers themselves. But who is actually responsible for the deaths, and for e-waste? What does such responsibility mean, and where does it end? Are we talking about the protection of property and the prevention of theft, about proper disassembly, or about ensuring safe collection without the loss of human lives? The incidents mentioned above show that questions about responsibility are closely linked with issues of monitoring, safety, and property.

This uneasy way of approaching e-waste contributes to the ambiguity of its related responsibilities. E-waste represents something desirable due to its content of potentially precious metals and, simultaneously, something undesirable due to the

portion of valueless and even hazardous materials it also contains (Lepawsky 2018). As Carmen Nadia Ciocoiu and Valentina Târţiu (2012: 28) put it, the two most pressing issues concerning e-waste are the following: first, it poses health and environmental risks; and second, certain kinds of e-waste contain various components and materials of potential value (e.g. rare metals) that can be reused or recycled. Its indeterminate (Alexander and Sanchez 2019b) position leads to the diverse paths that e-waste can take. On the one hand, it can end up forgotten and abandoned at a dump or next to public waste containers. On the other hand, it is fought for by scrapyards or stolen from collection yards. However, the scale of possible treatment is broader and does not include only these contradictory situations. Who takes responsibility for discarded electronics and how they do that affects the management and care of it (Ureta 2016: 5). The case of e-waste management in Czechia represents an opportunity to examine how responsibilities are negotiated against the background of the heterogeneous waste material in question. More precisely, these vague materials that are both wanted and unwanted in their entanglement with humans allow for deciphering the limits of responsibility.

Instead of dealing with the ambiguity and indeterminacy of waste, the field of discard studies, as presented by Max Liboiron and Josh Lepawsky (2022: 57), is concerned with the question "What is the right thing to do with waste despite the inherent uncertainties [and indeterminacies] that come with any attempt to know it?" (Lepawsky 2018: 105). They identify four truisms that are ubiquitous in waste studies: the belief that we know waste; the idea that humans are inherently wasteful; the assertion that "waste and pollution are externalities of economic systems"; and the belief that "purity can be achieved through cleanup" (Liboiron and Lepawsky 2022: 9–25). Liboiron and Lepawsky argue that "these ideas come from somewhere, and when they become truisms then certain definitions of waste, specific notions of responsibility and agency, and particular terms of action are normalized at the expense of others" (2022: 9). This is associated with systems of power. To overcome the truisms, they suggest four methods that should be applied by discard studies scholars: defamiliarization, denaturalization, decentering, and depurification. I build upon these methods to pursue an approach that reveals the systems of power.

The question of responsibilities in waste management[36] is tricky. It is well described by Zsuzsa Gille (2007), who discusses waste regimes as specific political, economic and social enactments of waste. Depending on the waste regime, different kinds of waste can emerge as significant objects of responsibility. Responsibility for waste can also become an important tool for performing political autonomy (Stamatopoulou-Robbins 2019). The ambiguous nature of waste does not contribute simple answers to the question of who is responsible. In this sense, Jennifer Gabrys (2013: 4) refers to "the sedimentary layers of waste" that "consist not only of circuit boards and copper wires, material flows and global economies, but also of technological imaginings, progress narratives, and material temporalities". Responsibility is not just a question of determining the responsible actor; it is a broader question of negotiating political, economic, social, and legal obligations that enter the decision-making about discarded things.

In this chapter, I deal with the division and limits of responsibility applied to e-waste management in Czechia. With the increasing amount of electronics sold and consumed, the issue of handling discarded equipment becomes ever more pressing. Understanding the distribution of responsibility in relation to the economic logic distinguished by self-interested rationality of recycling in Czechia, a member state of the EU, might help to indicate how the limits are established. In the following section, I introduce the debate on competing responsibilities presented by Susanna Trnka and Catherine Trundle (2017b) and emphasise the contribution of Marilyn Strathern's theory of cutting (1996) to this debate. The third section shows the uncertainties in the distribution of responsibility and the role of care in this process. The last two sections then identify the moments that constitute cutting: temporality and ways of knowing. The fourth section focuses on the temporal aspects of responsibility, particularly the temporal mismatch that proves significant in negotiating responsibilities in e-waste

[36] The sphere dealing with waste is commonly described as waste management. As some scholars have already shown, the notion of waste management assumes the problematic by-effects of thinking about waste as a matter that is fixed and limited (Gregson and Crang 2010: 1026) and something managed and solved (Gille 2007: 18). Building upon the ethnographic research of industrial solid waste in Chile, Sebastian Ureta notes that, in the process of dealing with waste, much more happens than just waste management. He focuses on care practices and approaches the caring for waste not "as necessarily contrary to managing it but as complementing some of its deficiencies to produce a more well-rounded way to deal with our contemporary wastes" (Ureta 2016: 5). Kevin Hetherington (2004: 159) even refuses the term "waste management" as a "misnomer." He argues that disposal is rather about placing than about waste, which refers to "a singular act of closure."

management. In the fifth section, I will point out the fundamental role of ways of knowing in relations over responsibilities.

Competing responsibilities and cutting

In Czechia, discarded electrical and electronic equipment becomes the responsibility of producers under the policy of Extended Producer Responsibility (EPR). This reflects the environmental policy approach introduced in Sweden in 1990 by the environmental economist Thomas Lindhqvist. He described it as follows: "Extended producer responsibility is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product" (Lindhqvist 2000: 38). This policy approach of making producers responsible has slowly been adopted across the world and includes, beyond electronics, packaging, tyres, end-of-life vehicles, lead-acid batteries, and other products (OECD 2016: 2).

After the collapse of the socialist regime in 1989, the newly formed state started to pass laws that were supposed to mitigate the environmental impact of heavy industry. These laws were also needed to deal with the marketization and increasing number of new types of waste. The first Waste Act came into force in 1991[37] and dealt with transboundary waste shipment and the temporary operation of unsecured landfills, remnants of the socialist era that were further closed during the nineties (CENIA 2005: 25–26). The following legal regulations were shaped by the motivation to enter OECD and later the EU and the effort to fulfil their requirements and standardise the processes accordingly. The preparation for the entrance to the European Union, especially, led to the Act on Waste in 2001,[38] which mentioned the take-back of electronic and electrical equipment for the first time. One year after the entrance of Czechia into the EU, the EPR policy came into force, and e-waste started to be framed within the idea of "polluter pays".

The producers of electronic and electrical equipment carry out their duties either individually or collectively. The latter option refers to the foundation of a company by

[37] Act no. 238/1991, Act on Waste (*Zákon o odpadech*).
[38] Act no. 185/2001, Act on Waste and on Changes to Certain Other Acts (*Zákon o odpadech a o změně některých dalších zákonů)*

three or more producers. Such a company is independently organised and managed, and takes on the responsibilities of the producers. These companies, called in Czech *kolektivní systémy* (collective systems),[39] operate in a compliance take-back scheme. There are five main collective systems for the take-back of end-of-life electronic and electrical equipment in Czechia. Based on this setup, it would seem that the responsibilities are clearly defined. However, EPR is accomplished through recycling fees paid by consumers. Therefore, the question of responsibility remains somewhat blurry. Josh Lepawsky argues that burdening the consumer with financial responsibility supports an understanding of waste as a post-consumer problem; however, the amount of final waste is affected by the design and durability of produced electronics, so cleaner production should be addressed within the EPR (Lepawsky 2018: 167–70; 2012: 1999). Currently, when the customer pays recycling fees (which may be visible on the receipt but may also be hidden), it puts no pressure on the producer or the production process. Instead, it leads to limited responsibility, which Lepawsky (2012: 1197) illustrates using a study claiming that, since the EPR has become policy in Canada and the United States, producers have not applied any standards guaranteeing the durability and easier recycling of their products.

The fact that the customer pays a recycling fee under EPR policy amounts to a restriction of democratic principles, which are present "only as long as they limit public decision making to waste already produced" (Lepawsky 2012: 1194). The responsibility is handed to individuals by making them pay, yet without giving them any ability to monitor the process. Such individualisation of responsibility—called responsibilisation—is a prominent tool of neoliberal policies that is linked with conceptualising individuals as "independent, self-managing, and self-empowered subjects" (Trnka and Trundle 2017b: 2). This view is also present in recycling discourses (Hird 2022: 10). As Catherine Alexander and Joshua Reno state: "The period between the 1970s and the present, […], is often characterized in terms of the reappearance of the eighteenth-century liberal emphasis on low central regulation, private commerce and individual rights, together with individual responsibility" (2012b: 16). Such liberal policies have further supported private businesses, but have also

[39] Other used notions are Producer Responsibility Organisation (PRO), or Waste Electronic and Electrical Equipment (WEEE) systems.

stressed political control. This liberal pressure on individual responsibility has been present in campaigns for recycling worldwide. In particular, the "Crying Indian" advertisement[40] became a symptomatic example of pressure on individual conscience. Thus, campaigns about proper sorting of waste are primarily directed towards consumers, which inversely reflects the scale of this issue (Liboiron and Lepawsky 2022: 82).

In an effort to refuse the individualisation of responsibility, Susanna Trnka and Catherine Trundle (2017b: 3) suggest "a new approach to understanding responsibility based on the concept of competing responsibilities". They emphasize the necessity to engage in "the nuances of multiple responsibilities" instead of reducing all responsibility to an individual one as promoted by neoliberalism. In the pursuit of destabilising "the purported ideal of the self-actualized and self-managing individual that stands in the centre of neoliberal rhetoric" (ibid.: 10), the authors, together with other contributors to the edited volume, examine various forms of responsibilities and their embeddedness in social and political frameworks (ibid.: 8). They aim to promote analysis of competing responsibilities to "reveal how the responsible subjects promoted by neoliberal ideologies exist within a matrix of dependencies, reciprocities, and obligations" (ibid.: 22). Drawing upon the critique of neoliberal policies in the work of Trnka and Trundle, it does not seem surprising that the individual is also at the centre of responsibilisation in the current promotion of recycling. Nevertheless, the policy measures adopted across the countries of the Global North do aim to make the leading waste producers responsible —it is just that they are relatively unsuccessful. Lepawsky's work (2012: 1197) implies that, although embedded in the policy measures, responsibility can be interpreted and materialized differently. Such loose perception raises the question of where and how the limits of the responsibility are negotiated.

Besides responsibilisation, Trnka and Trundle point out "other prevalent ways that responsibility is currently enacted: that is, other forms of personal responsibility;

[40] This well-known advertisement with the theme "People Start Pollution, People Can Stop It" was a campaign of the non-profit organisation Keep America Beautiful. The organisation was founded by large beverage and packaging corporations, and this public service advertisement was a reaction to the increasing number of demonstrations that held the industry responsible for the solid waste crisis caused by the rising number of disposable items. The advertisement depicts a Native American who comes across pollution when canoeing on a river and walking through a forest. The emotional level is boosted in the final moment when the camera zooms in on the man's face and the viewer can see him shed a tear (Liboiron and Lepawsky 2022: 81; Dunaway 2017).

care for the Other; and social contract ideologies" (2017b: 3). I understand Extended Producer Responsibility as a form of social contract ideology. "The underlying premise of social contract ideologies is that members of a group relinquish a portion of their individual autonomy and responsibility in order to gain protection and security and ensure that the wider collective assumes some measures of responsibility for and over them" (ibid.: 17). In e-waste management, the producer is ultimately responsible, but the citizens contribute to fulfilling the responsibility when placing their e-waste in the collection points set up by the collective systems. As part of the social contract, the citizens renounce the possibility of making decisions about the trajectory and fate of the discarded electronics. The producer's responsibility for carefully treating potentially hazardous waste materials represents a significant obligation towards human and nonhuman beings that share the same environment. Thus, it puts this kind of responsibility into the network of relations.

Considering e-waste management in terms of this network brings me to Marilyn Strathern (1996). She discusses the limitlessness of the concept of hybrids that became popular in the eighties and nineties as a critique of categorization and pure concepts. This thinking brought a new conceptualization of the network. "The concept of network summons the tracery of heterogeneous elements that constitute such an object or event, or string of circumstances, held together by social interactions: it is, in short, a hybrid imagined in a socially extended state. The concept of network gives analytical purchase on those interactions" (Strathern 1996: 521). Strathern follows Bruno Latour, who describes a network that "would link in one continuous chain the chemistry of the upper atmosphere, scientific and industrial strategies, the preoccupations of heads of state, the anxieties of ecologists" (Latour 1993: 11). However, Strathern addresses the problem of this analytical concept, that is, its limitlessness. She claims, that "analysis, like interpretation, must have a point; it must be enacted as a stopping place" (Strathern 1996: 523). For dealing with this issue, she turns to Derrida's metaphor of "cutting". Derrida engaged in the question of where interpretation stops, and "cutting" designates the moment when "one phenomenon stops the flow of others" (ibid.: 522).

The responsibilities related to e-waste management could be seen as the enactment of a network involving different actors, things, and other beings, imaginaries, and narratives. The limits of the responsibility can be found at the moments when the

networks are cut. Strathern pursues kinship relations to understand such moments of cutting. She shows that social relations can disrupt biological relations in Euro-American kin networks and vice versa. "One kind of reckoning never operates alone; it always operates in conjunction with factors of a different order. From the anthropologist's comparative viewpoint, 'kinship' has to lie in the combination" (1996: 530). According to Strathern, ownership represents one of the powerful systems for cutting in Euro-American societies. Ownership is conceived as having a double effect: belonging that divides, and property that disowns. As Strathern (1996: 531) adds, notions of ownership "challenge the interpretive possibility of limitlessness: the kinds of interests, social or personal, that invite extension also truncate it, and hybrids that appear able to mix anything can serve as boundaries to claims." In drawing upon Strathern's notion of networks and cutting, I understand responsibility as a form of obligation shaped within the network of relations among different entities. Like kinship, responsibility as an anthropological point of interest also lies "in combination." Further, I am inspired by the cutting process, which might help us understand how the limits of responsibility are negotiated.

In what follows, I scrutinize the practices of the actors within and close to one collective system in Czechia. Based on the legal frameworks and daily negotiations, I examine where responsibilities are limited. Responsibility is a challenging issue in recycling. On the one hand, it seems clearly defined in e-waste recycling. According to the EPR policy, the producer is responsible for managing discarded electronics. On the other hand, my deep dive into the trajectories of electronics made visible that there is not a single responsibility. Instead, e-waste management is entangled in several responsibilities whose enactments are interconnected. I elucidate the enactments of these responsibilities and disclose what kind of processes accomplish the cutting and generate the limits of responsibility. As I further argue, the cutting occurs along two avenues—temporality and knowing.

Confusion and uneven distribution of responsibility

"Do you want to join me on a trip to the landfill?" Lukáš interrupted me as I was controlling the contracts with municipalities; I was volunteering at the collective system Gamma, and my task was to scan new contracts between Gamma and municipalities

and enter them into the information system. I cooperated with Lukáš because it was a part of his agenda. Most of the time, this forty-year-old man was joyful and witty. Even though he made fun of me sometimes, we worked well together. Only a few days after my start at the company, he invited me to accompany him to a seminar on waste management for municipalities. The seminar was supposed to be held at the teaching and training centre at the landfill. I was excited to join him and visit an environment I had no experience with.

A few weeks later, Lukáš had to undergo an unofficial training in preparation for the seminar from Albert, the section director, and they invited me to join them. Albert, a charismatic man with a low-pitched voice, went through the slides of an already prepared and universally used PowerPoint presentation and stopped at new or unclear points. When we got to the topic of responsibilities in e-waste recycling, Lukáš was surprised that the producer shared responsibility for collection and recycling—he thought only the collective system was responsible. Albert explained that, for example, in the sphere of packaging waste, only one company operated in a compliance take-back scheme in Czechia: Omega. As a producer responsibility organisation focused on packaging, Omega represented a monopoly and was alone responsible for collecting and recycling packaging waste. However, in e-waste recycling, if problems occurred, the collective system and the producer would both be fined. Albert noted that it was up to the producers to keep an eye on it.

Lukáš's surprise over who is responsible for e-waste recycling represents a broader blurred notion about this sphere and the ambiguity in its self-representation. Although EPR policy seems to define the framework for the distribution of responsibilities quite clearly, in practices there are various divergences. The continuation of our visit to the seminar showed that responsibility was variously spread, shifted, or transformed. The confusion about the role and relationship between the producer and the collective system was just the tip of the iceberg. The day after the seminar I attended with Lukáš, I continued scanning the contracts in Gamma's office when Albert came and asked me about the seminar. He wanted to know whether any questions from the municipalities caught my interest. I responded that only the company director providing the seminar venue asked a few questions. Albert looked

disapproving. He added that the director worked directly with the waste, but the municipalities were responsible for it and often did not care.

According to the Czech Act on End-of-Life Products, the municipality, or more precisely its collection yard, is not required to keep a tally of accepted end-of-life products.[41] Instead, the collective system must gather this information from hauliers for yearly reporting. However, this gap between receiving the discards at the collection yard and their transport to the processing company by the haulier represents a grey zone (Frederiksen and Knudsen 2015; Mašek 2022). When this new Act was being prepared, Gamma tried to raise this issue in the comment procedure. Gamma saw the problem in that the municipalities have responsibility for this,[42] but do not keep any records.[43] The comment was not taken into consideration. Albert interpreted this to mean that the politicians did not want to make enemies of the municipalities by giving them extra work.

Albert added that some collective systems attracted the producers through very low recycling fees and then, in reality, did not collect. It was also common that some of the collective systems collected the recycling fees and did not care how the e-waste was processed. One collective system, for example, avoided paying for transport and processing. Instead, it only obtained numbers on processed e-waste from the scrapyards. These numbers were indicated in annual reports and reported to the state. The state monitored the quantity of collected and processed e-waste because the European Union obliges all member states to meet quotas for the amount of collected and recycled e-

[41] See Act no. 542/2020, §16 (3) „The producer is obliged to provide the municipality in whose territory the take-back point is established with information on the quantity of end-of-life products taken back, including information on their use, if requested by the municipality." (*Výrobce je povinen poskytnout obci, na jejímž území místo zpětného odběru zřídil, informace o množství zpětně odebraných výrobků s ukončenou životností, včetně informací o jejich využití, pokud o to obec požádá.*)

[42] Including measures in the Act no. 542/2020, §134 „The municipal authority of a municipality with extended competence (a) monitors the compliance by natural persons with the provisions of legal regulations and decisions of administrative authorities in all areas covered by this Act." (*Obecní úřad obce s rozšířenou působností a) kontroluje, jak jsou fyzickými osobami dodržována ustanovení právních předpisů a rozhodnutí správních orgánů ve všech oblastech působnosti tohoto zákona.*)

[43] The reluctance to gather data reflects the limits of statistics and quantification (MacBride 2022; Sosna, Stehlíková, and Mašek 2024). Liboiron and Lepawsky (2022: 37) report that in the case of the United States and Canada, data are collected when it concerns hazardous waste. Waste that is not classified as hazardous becomes invisible in the statistics. Such classification allows for an understanding of non-hazardous waste as nonproblematic and as less demanding when it comes to responsibility. When adapting the perspective of "ecologies of quantification" that encompass, aside from numbers and quantification processes, also the materiality, cognition and experience (Sosna, Stehlíková, and Mašek 2024), the absence of data might indicate the lack of relations to the waste.

waste. Albert did not understand why the state tolerated the suspicious activities of that collective system when he knew it had to be aware of it. He added that it harmed all e-waste management, because other collective systems had to pay for it.

In 2021, the Act on End-of-Life Products mentioned above came into effect. Under this Act, all collective systems were obliged to request authorization in compliance with the new regulations. In my discussion with Albert, I mentioned that it would be beneficial if the systems that are irresponsible in their obligations were not given the authorization. To my surprise, he disapproved of my idea. He pointed out that if such a collective system ceased to exist, it would harm all other collective systems. They would have to pay for the disposal of the products that were not subsidized. If the collective system were to disappear, the same would happen with the money from its producers, meaning the money that the producers had already paid to the collective system.

Based on these cases, it becomes clear that, for Albert, responsibility for e-waste is linked with care in the form of monitoring. Trnka and Trundle (2017b: 11) designate care as "a fundamental […] form of responsibility in contemporary social life". Care is linked with responsibility and represents its practical fulfilment. Maria Puig de la Bellacasa (2011: 90) states, referring to Bruno Latour, "We must take care of things in order to remain responsible for their becomings". Similarly, we need to take responsibility for the remnants of technological development—our waste and material flows—and not rely on technological solutions (Gabrys 2013: 155; Ureta 2016: 15). Demonizing or placing blame cannot erase the human responsibility for technological developments. At the same time, blaming (waste) infrastructures diverts attention from who is responsible and what consequences the resulting care has. Albert kept track of other actors' practices, as he felt responsible for Gamma's activities in the broader framework of the proper way to recycle e-waste. His concern about the municipalities' lack of care indicates that the responsibilities, and the awareness of those responsibilities, are distributed unevenly. This means that the actors do not approach their responsibilities identically, and the cutting is carried out differently depending on the position of the involved actors.

This situation shows how unclear the limits and the manner of their fulfilment are. The employees of the collective system do not know how its responsibilities are

shared with the producer. The section director, Albert, demands a higher degree of responsible action from municipalities. Finally, the state has its own interest, which is not to exacerbate its relations with municipalities. E-waste recycling is not affected only by the material reality of end-of-life products. There appears to be a strong role played by the imaginary of the responsible actors and ideas of what responsible action should be like. These could be understood as part of "the sedimentary layers of waste" (Gabrys 2013: 4). When digging out the stories beyond the matter itself, the employee, Lukáš, thinks about e-waste as the object of interest of his company. Therefore, he expects the company alone to be responsible. The section director has the opposite view, as he is familiar with the political, material, and economic implications of e-waste. Although he takes on the obligations of the collective system responsibly, he simultaneously considers it an essential role of her company to monitor the fulfilment of the commitments of other involved actors. This also includes the imaginary that e-waste is not a matter of concern only for the producer or the collective system, but that all actors in tangible contact with e-waste should take on responsibility. The responsibility is perceived as oscillating and limited by the object itself and tangible contact with it.

In the following sections, I analyse what formulates cutting and defines the limits which, I believe, the actors set unintentionally to make their responsibilities intelligible. Such cutting becomes realized at two levels. First, there is the level of creating the policy approach from the top down, and such an approach suggests temporal mismatch and thus temporally limited responsibility. Second, at the bottom, the actors must deal with the material specificity and heterogeneity of e-waste. The limits of their responsibility for e-waste are influenced by ways of knowing.

Temporal mismatch

On my first day at Gamma, I went for lunch with Milan from the technical department, Martina from the finance department and Dušan, a jovial man from customer service. During lunch, Dušan asked me what I was doing at Gamma. He was the oldest of us, and I used the polite form of Czech with him. He seemed to be a serious person. Therefore, I was surprised when he suggested that I could do the same research in the

competing collective system and then pass all the information on to Gamma.[44] Having said this, he started to laugh. His laughter was contagious, and I realized he was joking. Then Milan asked him where he had been the day before. Dušan explained that he had been in meetings with clients. I was confused, and asked him who their clients were. "The producers", he replied, looking at me as if he was surprised that I would ask something so obvious. I was not expecting such an answer because I had envisioned a client as customer: a physical person buying an appliance. It was obviously an ill-considered idea—naturally, the collective systems provide services for, and on behalf of, producers. But is it really so natural?

The confusion over the producer's responsibility that Lukáš had expressed earlier suddenly seemed less surprising. Within the collective system, the producer is understood to be in the position of customer or client. This is quite a different role for the producer. As a client or customer, the producer is not the one who is responsible. Instead, he is the one who is taken care of, or for whom responsibility is taken. In this way, collaborating with the collective system seemed to allow the producer to be absolved of responsibility. I am inspired by Liboiron and Lepawsky (2022: 11), who define the crucial task of discard studies as interrupting "popular, intuitive, expected, and common narratives about waste and wasting by using empirical research and cases from a range of disciplines. This methodology is based on the idea that what is normal is a cultural process, not a natural given state". Here, they specifically refer to the method of defamiliarization. Drawing upon this method, I understand the current setting of the relations between producers and collective systems as shaping two diverse perceptions of the producer's role. Further, I combine the method of defamiliarization with that of denaturalization, assuming that "waste practices, including disposability and hoarding, are specific to a time, place, culture, and system rather than inherent, 'natural' human characteristics" (Liboiron and Lepawsky 2022: 18–19). I believe such a combination of methods helps me stay aware of complicated realities that I might otherwise be susceptible of taking for granted.

[44] The director and section directors of Gamma were indeed afraid of such a scenario. Their concerns about me leaking Gamma's information to other collective systems led to a meeting in which I felt like I was in front of an examining committee. However, this meeting subsequently resulted in an agreement on my internship at their company and the signing of an informal consent and non-disclosure agreement.

The legal form of collective system organisations is embedded in capital relations. A company must gather ordinary capital to become established, and then must form either a joint-stock company (as in the case of three of the collective systems) or a private limited liability company (in the case of the two remaining collective systems). The difference between the two is in the type of ownership. In the context of collective system organisations, it is customary that the producers of electronics are also shareholders, and thus owners, in a joint-stock company. However, in the case of the collective system Alpha, these positions were occupied until the end of 2022 by three board members who had the largest share in the collective via their different companies that did not produce electronics. It meant that nobody from the producers had real insight into what the collective system did, because they were not part of the general meeting, which is the supreme body that makes the most important decisions. I suspect these producers were also reluctant to care about the issues related to their products' post-consumer life. It is possible to understand it in the way that Alpha's care about the producers allowed them to hand over their duties, pay just a little, and do this effortlessly while not having to worry about what happens next.

The managing authorities are similar at both joint-stock and private limited liability companies, including a supervisory board, a board/executive director, and general meeting. The board, including the director (chairman of the board), is answerable to the supervisory board, and both are accountable for running the collective system. The essential question is who constitutes the members of these authorities. Except for Alpha's case, the supervisory boards of the other four collective systems consist of the electronics producers. This role put them in a responsible position. At the same time, they acted as the customers of the system. However, not all producers who were joined together in one collective system served on their board. Only those producers who produced a considerable amount of electronics and were vital actors in the electronics market became board members. The number of shareholders varied from five to ten in the collective systems. Such a structure created specific power relations: responsibility for the actions of many was held in the hands of a few. The rest of the producers were not shareholders but were involved in the system. They had no less responsibility for the end-of-life of their products according to the EPR policy. Still,

their capacity to monitor their processes was limited, as Mr Urbánek, Gamma's director, mentioned in our interview.

The producer is responsible for producing a safe electronic or electrical appliance and for its functioning in the warranty period, as well as for following the EPR policy the proper management of appliances after they are discarded. The latter is enacted in the form of a recycling fee paid by the consumer through the producer to the collective system when the product is launched in the market. In practice, the collective systems compete to convince the producers to join their collective system. The techniques used in this competition correspond to the common market strategies to attract new or retain old clients. They try to offer the most advantageous recycling fee. Some collective systems were founded by producers, but not all of them were—the exception was Alpha. Alpha was founded as a "family business" by three men who had nothing to do with electronics manufacturing. Regardless of who stands behind the foundation of these companies, the collective systems depend on the recycling fees paid by the producers. Therefore, the collective systems try to maximize the number of producers that fulfil their duties through them. A recycling fee is paid for each piece of electrical and electronic equipment and can range between 6.50 EUR for a fridge-freezer, 2.30 EUR for a washing machine and 0.04 EUR for a smartphone.[45] The producers pass on the recycling fees to the consumers by including them in the price of the commodity. The producers pay an annual amount to the collective systems based on the quantity of products sold in that year.

The recycling fees represent the materialisation of the producers' responsibilities and are a vital part of EPR. I leave aside the debate on who ultimately pays those fees, which I discussed above. Instead, I suggest paying attention, first, to the dual purpose of recycling fees and, second, to what I call a temporal mismatch. First, the primary purpose of the recycling fee is to exert pressure on producers to take on responsibility for greener production and the end-of-life of their products. Simultaneously, it functions as a market competition tool of collective systems to attract producers perceived as clients.

[45] These numbers are taken from pricelists of the collective systems. which must be made public according to the Act on the End-of-Life Products.

Second, the requirement to pay recycling fees up front means that the producers pay in the present for their future obligations. The responsibility for the end phase of the produced electronics cannot be enacted at the moment of their launch in the market but is postponed. It may take some time before a product is discarded, and its proper recycling must be paid for. Changes in the technologies, legal frameworks, and prices may accompany such a temporal mismatch—that is, recycling can be more or less technologically, legally, and economically demanding compared to the year when the producers paid the recycling fee. Despite formal rules and regulations, the inner workings of the system remain fuzzy. It also has some other implications. When the producer decides to make a change and switch to a competing collective system, it does not transfer over the recycling fees it paid for the future disposal of their products that were launched in the market in previous years. Despite this, the collective system uses the fees the year it gets them, either to spend it on the services that need to be provided the same year or to deposit it into the reserve fund.[46]

The temporal interval makes responsibility abstract without the possibility of directly seeing the consequences of producers' actions. The hybrid of this abstract future and concrete objects in the present sets the limitations on the responsibility for e-waste. Temporality cuts the responsibilities tied to the post-consumer phase of electronic and electrical equipment. The responsibilities seem to be executed more easily when the object of interest is tangible, and the actors can be bodily entangled with the material. The distance from the end-of-life phase of the products, both temporal and spatial, allows for making the responsibility abstract and thus forming the limit. In the following section, I show the everyday actions of collection yard workers who decide the destiny of discarded appliances in the first place.

[46] The collective systems must manage their finances carefully and be good stewards. The goal is to set the recycling fees to cover all expenses for the logistics and management of collecting and processing e-waste. According to the Act on End-of-Life Products, collective systems are also obliged to keep a reserve fund that should reach 50 per cent of the total expenses of the collective system. They are forbidden to use the recycling fee paid by the producers for anything other than the activities related to e-waste recycling, and to distribute the profit. They are also legally obliged to set recycling fees so that they do not exceed the expenses associated with providing e-waste recycling in an economical way.

Ways of Knowing

Each collective system has regional managers who are responsible for communicating with the municipalities and the collection yards. In Czechia, municipalities operate waste collection yards to collect waste from their inhabitants. This waste includes categories other than household waste, such as separated plastic, paper, glass, and metal waste, e-waste or oversized and hazardous waste. In the yards, the collection yard workers take care of organising the waste collection and its placement. The collection yards are administered mainly by the technical services of the municipality, a state-funded institution. In other cases, a private company has a contract with the municipality to manage the collection yard. The property arrangement further affects how allowances from the collective systems are distributed and, ultimately, to what extent the collection yards are motivated to treat e-waste in the most desirable way.

Gamma's protocol required that the regional managers visit each collection yard at least once every two years.[47] I participated in some of these visits along with Gamma's three regional managers. The first time I accompanied a regional manager, Karel, to three Czech towns, I did not entirely understand how the cooperation between municipalities and the collective system worked. After we left the first collection yard on our list of planned visits, Karel asked me, while driving the car, what I thought about that visit. I told him that I didn't understand the system of financing. It wasn't clear to me how it worked when the other collective systems contracted with and, thus, financed the same collection yard. How was the e-waste then distributed between the two collective systems?

Karel explained that the distribution depended on what prices the collective system offered. The municipality received an allowance from Gamma for the collected e-waste measured in tons. Gamma managed only the discarded appliances and devices that were from their producers. However, it did not mean that Gamma monitored whether the appliance was of a particular brand—instead, the collective system concentrated on selected types of electronics that its producers mostly sold. According to the WEEE Directive,[48] the appliances are divided into six categories (temperature

[47] These visits to collection yards were actually called *kontroly* ('inspections'), but to decrease pressure on everyone involved, the Gamma workers called them 'visits' in formal communication.
[48] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).

exchange equipment, screens and monitors, lamps, large equipment, small equipment, and small IT and telecommunication equipment). From 2005, when the collective systems were established, till 2018, the e-waste market was divided into ten categories of e-waste. Karel saw the problem as originating in the change to the law in 2018, which mandated that each collective system should collect everything. But why should they collect something they were not paid for, Karel wondered. Mr Urbánek expressed a similar attitude during our interview a few months earlier.

Responsibility for discarded electronics seems to be overshadowed by economic concerns, or more precisely self-interested rationality (Gudeman 2016). E-waste is not understood as a homogeneous mass (Reno 2016: 63); it is highly differentiated from the perspective of collective systems. The object of interest then shifts from general care for e-waste to specialized care in response to the specific demands and needs of a selected type of e-waste. This resembles the plastic waste treatment described by Samantha MacBride (2013: 178). When recycling, a PET bottle and a PET tube must be separated, as they entail different labour and technology costs, although they are both made of the same polymer. The recycling market has, however, developed around only one of these types of discarded products—the PET bottle—as a result of the quantity and quality of this waste material. Similarly in case of e-waste, responsibility is limited not directly by economic prudence but by the categorization of e-waste and the demands of its treatment.

Despite the 2018 change in the duties of collective systems obligating them to collect every type of electronics, the old distribution of e-waste categories between individual collective systems set by the previous legal measures persists in the everyday practices of the actors participating in e-waste recycling. One of the reasons is infrastructure. According to the kind of electronics that collective systems deal with, they create an infrastructure of specific types of containers, collection points, transport, and processing companies. For example, refrigerators need different handling than mobile phones due to their volume and content of toxic materials. However, the main reason for maintaining the old distribution is economic, as Karel and the director emphasised. The recycling fees are paid to the collective systems for selected types of electronics. Thus, although the amended law brought a change, the producers collaborating with any given collective system remained the same. This also means that

the composition of the e-waste for whose treatment the producers paid fees to the collective systems also remained the same. Finally, the stereotyped behaviour of the collection yard workers who are accustomed to giving selected types of electronics to a particular collective system, contributes to maintaining the old distribution of e-waste categories.

Responsibility is relational and dependent on specific situational factors. The relational aspect of responsibility is highlighted by Laidlaw (2010). He analyses responsibility with respect to agency as a quality not inherent to an individual but involving other entities. Responsibility thus emerges in the broader networks of relations. Situational factors form such a network affecting responsibility. One such situational factor is how the actors know the e-waste. As Sosna (2024: 164–65) points out, when the understanding is too particularistic, it may lead to a diffusion of responsibility. I already noted that, although I keep discussing e-waste as if it is a homogeneous mass, in the practices of e-waste recyclers, the e-waste is heterogenized in various ways. First, knowing e-waste (Butt 2023; Alexander and O'Hare 2023) is characterized by its classification into six categories. Second, the collective systems have their own categorizations. Gamma, for example, sorts the electronics according to how they are transported and stored; Gamma has containers for large and small appliances, containers for refrigerators and other cooling systems, crates for small appliances, and so-called bulk appliances. Third, a division is made between appliances with or without toxic substance content. Fourth, and most importantly, the collective systems divide the types of electronics according to what their producers produce.

The last approach to e-waste heterogenization has a significant impact on responsibility. Along with what has already been described, I add one more instance: In the summer of 2019, one leading producer suddenly changed its collective system from Beta to Alfa. This caused several problems. Beta immediately stopped taking its products from the collection yards, but Alfa did not have the infrastructure to collect them. The desperate collection yard workers then asked for help at the competing collective systems. In exceptional cases, the competing collective systems complied with their request. However, they expressed disapproval of such a situation because they did not get the recycling fees for collection of this waste. This case shows that the collective systems do not understand their responsibility as contributing to maintaining

an inhabitable planet. Their responsibility is limited by the financial support of the producers they join. The cutting is done by their knowing of e-waste—their recognition of only those electronics that are economically favourable to them.

From a slightly different perspective, the electronics that are economically desirable for the collective systems could also be perceived as being owned by them. The fact that the collective systems feel responsible only for the e-waste they own might then represent the moment of cutting responsibilities. As Strathern argues: "Ownership is powerful because of its double effect, as simultaneously a matter of belonging and of property. Euro-Americans will not have to look far in order to determine network length" (1996: 531). However, I argue that, in e-waste management, the way of knowing through classification practices (Butt 2023: 13) becomes essential. Unlike ownership, the way of knowing as a moment for cutting responsibilities allows for a looser interpretation and application when involved actors are negotiating their specific responsibilities.

Summary

The blue containers and the deaths linked to them mentioned in the introduction to this chapter raised the question of the multiple responsibilities that become enacted in e-waste management. Building upon Trnka and Trundle, I approach these responsibilities as competing in the sense that they "challenge the dominance of discourses of neoliberal responsibilisation" (2017b: 22). The collective system that owns the blue containers is caught between several responsibilities. There is the responsibility to provide collection points as stipulated by the Act on End-of-Life Products. The containers represent a great solution that makes it easier for citizens to recycle electronics. At the same time, the collective system is responsible for the e-waste once it is thrown into the containers. It should prevent thefts that could lead to improper handling of discarded electronics. Finally, these responsibilities stand in contrast to the personal responsibility of the citizen who uses the container in a different way than it is intended.

Neoliberal responsibilisation makes consumers responsible for e-waste disposal by obliging them to pay the recycling fees. This personal responsibility, however, competes with what Trnka and Trundle label the social contract ideology embodied in the Extended Producer Responsibility policy. Social contract ideologies, together with

another form of responsibility—care for the Other—"foreground forms of dependency, interdependency, and recognition that are often downplayed in neoliberal rhetorics" (Trnka and Trundle 2017b: 22). On the one hand, this policy approach of EPR supports neoliberal responsibilisation (Lepawsky 2018: 167–70). On the other hand, I show that the producers and collective systems take on responsibility. Still, they do so by carefully assessing what is necessary concerning the political, economic, and technological consequences. This further led me to interrogate how their specific responsibilities are understood and where they end. Drawing upon Strathern's exploration of cutting networks and conceptualizing responsibility in terms of networks, I tried to elucidate the limits of responsibilities for the networks of e-waste collection, transport, and processing. I argue that the way cutting occurs is dependent on temporality and ways of knowing. The negotiations of responsibility along the temporality and ways of knowing further contributes to reduce expenditure on recycling. In the following chapter, I will examine how the competing responsibilities intertwine with the numbers and "incompleteness" in e-waste management.

5. The Heaviness of the Kilo

In the middle of March 2022, I was helping with administrative work at Gamma when the company's managing director asked me if I wanted to go into the field. "We need somebody who would examine the incompleteness in one e-waste processing company," he explained. "We are losing precious materials." For the rest of the day, my colleague Milan made fun of me, depicting images of me lifting heavy refrigerators to check whether they had compressors. I asked him whether there was a suspicion that the recycler was concealing something. Milan told me that they cooperated with another similar processing facility that reported much lower levels of incompleteness. Based on the type of transport, either the recycler or the haulier examined and documented the incompleteness. Milan continued that the control's goal was to find out whether the haulier was reporting the correct numbers. He added: "But, you know, they collect the e-waste from the regions *kde je černo* (where it is black);[49] our material is disappearing there." By this racist comment, he suggested that neither the recycler nor the haulier might be to blame.

Incompleteness means when appliances are in a state of missing some of their parts. This lack of completeness happens when somebody removes the parts of the appliance after it has been discarded and before it has been dismantled. During the months I spent at Gamma, incompleteness proved to be the most discussed topic. Why was it so important? The loss of precious materials would be a relevant reason, but my question aims at the broader relations, illuminating the significance of the material quality. Incompleteness invited the involved actors to a closer exploration and thus forced them to look from the lightness of numbers on paper or on a monitor's screen into the heaviness of realities behind it. Incompleteness represents a significant part of the material quality of discarded electronics, which forms the biggest challenge for the actors in the e-waste recycling sector. The collective system aims at preventing incompleteness. It is responsible for adequately handling e-waste, which involves avoiding illicit activities in the treatment of discarded electronic and electrical equipment, as I have already implied in the previous chapter. These include the

[49] "Kde je černo" is a racist notion implying that the proportion of Roma people living in those areas is larger than in other parts of Czechia and anticipating their criminal activity.

practices of collection yard workers or consumers who remove and sell valuable parts from the appliances.[50] The rest of the robbed appliances are then discarded at collection yards that are obligated to receive both complete and incomplete electrical equipment according to the new Act on the End-of-Life Products. This obligation causes two types of problems: first, the collective systems and recyclers lose valuable parts of e-waste, and second, there is a potential risk of environmental pollution caused by improper handling. These problems point out that incompleteness represents a substantive quality. Moreover, this quality renders all numbers concerning the collection of e-waste questionable.

Incompleteness may be reflected, invisibilised, or compared by numbers. At Gamma's office, the numbers were floating in the air. The management of discarded electronics seemed to be nothing but dealing with numbers. The weight of containers was combined with the number of discarded washing machines and container identification numbers. Despite coordinating the whole e-waste recycling system, the company employees mostly had no direct or physical contact with the waste electrical and electronic equipment. Thus, the numbers served as the proximation tool to monitor the processes related to recycling. The controlling mechanisms at Gamma relied on the numbers. However, the numbers don't represent a reliable source of information when stripped of their relations (Sosna, Stehlíková, and Mašek 2024). When considering their relations, here, put two isolated numbers—the rates of incompleteness—into comparison; numbers convey richer and more coherent information. In the case mentioned earlier, this also means the need for further control directly on the spot. Thus, numbers have a dual role: on the one hand, they serve as "a technology of distance" (Porter 1995) and allow not to get hands dirty; on the other hand, there is ubiquitously accepted awareness of the insufficient capacity of numbers to convey the actual situation, therefore, "the technology of distance" is surpassed and the numbers get under close scrutiny.

In the article we prepared with Daniel Sosna and Pavel Mašek (2024), we suggest applying the broader notion of ecology in the perception of quantification that extends beyond the numbers. Ecology involves materiality, cognition, and experience,

[50] The valuable parts include, among others, compressors from refrigerators, motors from washing machines, and high-voltage transformers from microwave ovens.

recognising those being continually in the process of becoming. Following the scholarship that approaches numbers as being inherently relational (Day, Lury, and Wakeford 2014; Verran 2010), we "situate quantification of waste in a broader relational space that includes the senses and experience" (Sosna, Stehlíková, and Mašek 2024: 7). I build upon our arguments and focus on the processes through which numbers come into being. I ask the following question: What are the practices embedded in the material reality that allow for the emergence of quantification?

Sophie Day, Celia Lury, and Nina Wakeford deal with numbering practices that involve more than calculation. Their ecological approach "leads [them] to explore where numbers come from and where they go, the ways in which they can be detached and reattached, their variability and their constancy" (Day, Lury, and Wakeford 2014: 128). The authors inspired by "Rabinow's (2009) use of the notion of the work of Bildung, the work of forming or shaping," highlight the processuality of numbers as the crucial condition for "what that number is and does" (Day, Lury, and Wakeford 2014: 128). They introduce several practices of numbering, such as zooming, folding, scoring, pausing, accreting, knotting, diffracting, gridding, scanning and cutting (ibid.: 129). I found their approach focusing on the process of "the *doing* of number – number-*ing*" (ibid.: 130; emphasis in original) inspirational, and I adopt a similar perspective and examine the concrete material activities that contribute to forming the numbers.

Except for observing the processes that bring numbers into practice, I look at the work to curtail reality into its abstract numerical representations beyond it. It means that, unlike Day, I don't engage in the "forms of *participation in number*" (2014: 124; emphasis in original). Instead, I focus on the human entanglements with materials as the heavy realities of the processes that make numbers possible in the meaning of the activity that demands spending a substantial amount of energy. I understand numbers' capacity as *lightness* in contrast to the *heaviness* to express the unbalanced process of numbers creation and use. Using these metaphors, I move from weight as a general category for measuring waste to its perceptions as characteristics of the processes that accompany weighing. I bring attention to the everyday actions requiring the hard manual work that entails physical and mental strain. The hauliers or workers at the e-waste processing facility must lift and carry heavy appliances such as washing machines or refrigerators when machinery cannot be used. This heaviness contributes to the

production of numbers that acquire lightness. The lightness accompanies the moment they are written down. With lightness, they might be erased or changed, and the lightness allows for a loose interpretation. I argue that incompleteness offers an excellent example for following the process of becoming numbers because its understanding requires a consistent move back and forth between the spheres of material realities and abstract decision-making.

The prevalence of quantification, including the dependence on the numbers expressing the weight of things, reflects that we live in a globalised world dependent on the smooth flow of goods, capital, and people. As Porter (1995: ix) puts it: "Perhaps most crucially, reliance on numbers and quantitative manipulations minimizes the need for intimate knowledge and personal trust. Quantification is well suited for communication that goes beyond the boundaries of locality and community. A highly disciplined discourse helps to produce knowledge independent of the particular people who make it." However, incompleteness as an imperfection in the e-waste material shows that this independence is not unshakeable. Knowing numbers and the way they are created by particular people become essential at the moment when the material qualities of objects are disturbed. It is easy to measure something complete, but how to approach something that does not fit into the categories. Using numbers assumes the ideal situation with a clear division of categories. In the opposite case, bodily proximity facilitates individualization of things contained in the broad category of e-waste.

Waste is measured in terms of weight. Whether it concerns reports or policy documents focused on collections, recycling, or global waste flows, the waste is linked with kilograms or tonnes. It differs from the commodities whose sale is measured in number of individual items, and their global trade is monitored in terms of financial value. The reference to weight allows waste to be presented as a homogeneous mass. Thus, Reno (2016: 6) speaks directly about mass waste when he reflects on how the waste is dealt with in North American and European contexts. His term highlights what can "no longer refer back – like animal scat – to the body that left it behind. Mixed in with the wastes of other people, discards lose their indexical connection to the being that generated them, they become anonymous and acquire an abstract, general character" (Reno 2014: 17). Similarly, discarded electronics are approached as e-waste. Such vision shadows the variability of materials and the potential for toxicity, as

Lepawsky (2018: 96) shows. Reno (2016: 120) and Sosna (2017: 173) further highlight that the conception of mass waste ignores the relations that wasted items might create and become significant individually through these relations. I argue that the vision of mass waste in the case of e-waste is disturbed by the incompleteness that forces the interested stakeholders to participate in e-waste as a set of single items.

In this chapter, I focus on the formation and use of numbers. In e-waste management, these numbers do not emerge in the dry and cosy offices but in the yards of collectors and recyclers. Although there is a direct connection with material qualities, the numbers do not reflect this, and the workers usually do not take care of it. The numbers are created in close entanglement with the material properties that are further left out physically and mentally. Subsequently, these numbers are stripped of these relations entirely by being transferred to the offices. I look at how numbers emerge as the tool of control, proximity, and bragging and how their realities on paper radically differ from their lived realities of creation. The sphere of e-waste is important for the life of numbers due to an ideal of completeness that is not always achieved. I look at the role of numbers in the e-waste recycling sector and how they are affected by the incompleteness as a distinctive feature of discarded electronics. Incompleteness draws attention back to the singularity of waste, to the fact that it is not just a mass or waste flow, as Reno puts it, but a large amount of many singular pieces.

The first section shows how weight is a crucial unit to be measured to keep control of the collective system's profit. In the following section, I elaborate on the e-waste's incompleteness, which distorts the apparent testimonial value of numbers. I describe how incompleteness leads to a cognitive shift from e-waste as a mass to e-waste as singular items that need to be explored in bodily proximation with specific habituated skills and approximate knowing of quantity to provide reliable numbers. However, these numbers work only in relations, or in other words, in ecologies, when they can be commensurate. In the third section, I describe the systems of measurement in e-waste management that provide the reference numbers for commensurations. Finally, I disclose how the flexibility of numbers is applied in a broader scale of national and European policy.

Weight and the profit

On the last Wednesday in March 2022, Albert returned to the office after visiting the processing company mentioned above, where he discussed the discrepancy in the ratio of incompleteness. He found out that the company's employees do not see the ratio of incompleteness reported by the haulier in the information system provided by Gamma. However, they examined incompleteness on their own, and they discovered that their numbers were inaccurate. According to their calculations, the average incompleteness ratio was 19%, but there was a difference between the companies from which they received e-waste. Alpha and Beta, the other companies operating in compliance take-back scheme, delivered the e-waste with an incompleteness of 80%. By contrast, the incompleteness of Gamma's e-waste was only 8%. The e-waste processing company expected a higher incompleteness ratio; therefore, they paid Gamma only a tiny part from the profit from the compressor's sale. Once it became clear, that the e-waste from Gamma does not have so high incompleteness ratio, the recycler had to give Gamma the more considerable part from that profit.

Gamma has a clear financial motivation to monitor incompleteness and make efforts to prevent it. It was also apparent that their efforts brought the results. Still, the data mentioned above raises the question of why Gamma has such a low incompleteness rate compared to other collective systems. I believe this contrast is given by three factors that play a role at Gamma's attempts to avoid incompleteness. First, although all collective systems are obliged to collect all waste electronic or electrical equipment, they tend to manage those types that were historically assigned to them. It means that Gamma collects mostly large appliances, whereas Alpha and Beta deal with IT electronics. There is a huge difference in the material qualities, particularly in weight. Moreover, IT electronics contain precious metals, which is not the case for many other appliances. However, this factor should not be so significant in terms of incompleteness, as the weight of missing parts will also be low. That is not the case with large appliances where the incompleteness is more obvious when comparing weight, so Gamma tries to avoid it.

Second, another essential factor is that Gamma shares the profit from selling extracted materials with some recyclers. This profit sharing means that companies have an incentive to prevent the most valuable parts of appliances from going missing, as this

would reduce their chances of making a profit. In order to be aware of the ratios of gained materials, the recyclers are encouraged to undergo so-called batch tests.[51] Third, the incompleteness of electrical appliances causes other inconveniences besides financial loss. One such challenge was meeting the collection quota set by the EU, which was approximately 53 to 55 thousand tonnes of e-waste per year for Gamma. The necessity to ensure a sufficient collection and prevention of incompleteness was even more urgent in Gamma's case because the weight of sold appliances by its producers was higher than in the case of Alpha and Beta. By contrast, Alpha demonstrated the ability to play with numbers in reporting, thus avoiding the necessity of achieving the collection rates. I will elaborate on this case further in the text.

The incompleteness was considered a severe difficulty at Gamma. Once, Milan and Albert were caught out by the high ratio, 47%, of incompleteness at one collection yard in the capital city. Albert estimated that the loss is almost two million Czech crowns (around 80 thousand Euros). The standard ratio of incompleteness was about 10 to 15%, as they explained to me. A few weeks later, Milan told me that the motor from the washing machine weighed eight to ten kilos and that the robbers would get about 250 crowns for it at the scrap yard because metal prices were high at that time. When they emptied approximately 50 washing machines, he continued, they had about 10 thousand Czech crowns. Another day, Milan came to my desk and showed me the photos documenting the incompleteness of some appliances. The photos captured the difference between complete and incomplete electrical equipment – the fridge with or without a compressor, the washing machine with or without a motor, and the microwave oven with or without a high-voltage transformer. These are the valuable parts that become easy haul for thieves.

Since January 1, 2021, when the new Act on End-of-Life Products came into force, the collection yards were obliged to receive complete and incomplete electrical equipment. It meant complications for everyone involved in the compliance take-back scheme and significantly affected the numbers linked with e-waste recycling. As

[51] The WEEELABEX Normative Document from 7 May 2013 defines batch testing as "manual or mechanical processing of a definite and well-defined amount of WEEE or fractions thereof to determine the yields and compositions of the resulting output fractions and de-pollution performance." (The WEEE Forum, which joins the community of WEEE processors and producers of electrical and electronic equipment, started the WEEELABEX project to focus on the normative requirements that operators, i.e. collection facilities, logistics operators and treatment sites, are expected to comply with.)

a reaction to the increasing ratio of incompleteness, Gamma began to focus on informing all concerned about this risk and its consequences. Milan made some trips to discuss incompleteness with the waste collectors and hauliers and to train them to recognize the difference. Although mostly, one could see that a part was missing, there were cases when the robber knew how to hide it. Therefore, the training was necessary. Gamma further emphasised this topic in their educational materials. They created a banner informing about the consequences of incomplete appliances that the collection yards could put up at their entrances. In colourful graphics, the banner depicted the hazardous substances (such as chlorofluorocarbon, asbestos, and mercury) that could be released if e-waste was handled improperly and what health complications they could cause. On their website, Gamma also published an article pointing out the risk of leakage of toxic substances. Therefore, it is apparent that Gamma put a lot of energy into preventing incomplete appliances.

The employees of the collective system monitored the collection of e-waste without having direct personal experience with the process beyond rare visits to collection yards and processing facilities. The numbers served as proxies for the monitoring of e-waste streams. Weight represents a plausible unit of waste management, as it can be measured, and the resulting number can be compared and managed. Together with monetary worth, then, they constitute "key modes of knowing and representing waste materials" (Butt 2023: 544). The weighing is also essential in tracking and monitoring the flow of materials and capital. Still, these numbers provided only partial information. As Josh Lepawsky (2018: 96) emphasises: "Weight is relatively easy to measure, but it tells us nothing about other important characteristics of e-waste such as its potential for toxicity (e.g., 1 kilogram of aluminium and 1 kilogram of mercury are identical in terms of weight but radically different in terms of toxicity)." Incomplete appliances represent the risk of toxicity; for example, the compressors from refrigerators contain oil and chlorofluorocarbons. If these substances are not drawn off properly, which is more than can be expected from those who steal the compressors, pilfering parts generates risk to the environment and human and nonhuman health. The numbers indicating the weight of e-waste can inform Gamma about incompleteness, but they do not reveal potential harm. Weight also doesn't necessarily convey reliable

information to follow. The weight is questionable because of the material's quality, as Karel's experience demonstrates.

I met Karel in June 2021 when I joined him on the regular visits to the collection yards, which was part of his work as a regional manager. I came by bus to the small town located near Prague. Karel and I agreed to meet at the parking lot in front of the supermarket. Based on my website exploration, I knew I should search for a young red-haired man. I recognized him when he got out of the car because he saw me coming. We had time before visiting the first collection yard, so we sat in the car. The morning was cold, and despite my expectations, it did not warm up during the day. After a short chit-chat, I told him about my exploration of the numbers at the Czech Statistical Office and the mistrust I felt towards those numbers. He told me that when he started to work in a scrapyard, his previous job, they had to note down everything to the grams of weight. The workers at the scrapyard didn't fuss about it and always told Karel to put down this or that, for instance. He opposed them and said that it needed to be accurate. So they encouraged him to look at something. They took a piece of rail profile and they weighed it. Then, they started to burn it through and divide it into several pieces. They weighed the separate pieces, and in the comparison of the total weight, the number decreased by several tens of kilos. I was surprised and asked him how it was possible. Karel answered that something had burnt and some kilos were the dirt. He added that the material was not reliable.

The negotiations of incompleteness are closely linked with the calculation of weight and money losses. The stress on these two losses highlights how e-waste is known in the context of collective systems. Alexander and O'Hare (2023: 432) note that modern waste management relies primarily on "technical solutions based on quantification and containment." Similarly, Josh Lepawsky (2018: 103), who deals directly with e-waste, writes that "the majority of regulatory frameworks for managing e-waste are premised on metrics of weight." Immediately, he adds that the choice of a mode of measuring "is political in the sense of making decisions with potentially transformative consequences in a terrain of uncertainty" (ibid.). In a collective system, waste is known as mass, and incompleteness is discussed in terms of ratio. However, when deliberating over the possible monetary losses, the administrators take into account the singular parts of particular appliances, as Milan referred to the weight and

price of motors when calculating the potential profit of a robber. This approach signifies a substantial cognitive shift that suddenly, only due to the imperfection or unreliability in material's quality, draws attention to single item instead of mass. The focus on individual appliances brings me to the following section, where I look at the moments of proximity when the incompleteness should be recognized.

Knowing of incompleteness

It was a sunny day when I observed how Milan, Dominik, and two other workers were handling the washing machines, dishwashers, and other smaller e-waste in the yard of an e-waste processing facility in the middle of Czechia. I joined Milan and Dominik on their business trip to the field based on Milan's somewhat unexpected suggestion only one day before. We carried out *vzorkování* (sampling). It meant that we checked the content of the random container and made its thorough analysis. They lifted the appliances on the weight scale pallet truck. I stood there with a pen and paper and wrote down the numbers of particular types of electrical appliances and the measured weight. The ground was quite uneven and unclean. The small pieces of electronics, including various screws, on the ground got stuck in the pallet truck's wheels and made its moving harder. We also discovered it matters where we put the appliance on the pallet truck. The wrong position could distort our measurements. At that moment, a truck pulled up right next to us. The haulier needed to unload several washing machines and a few ovens quickly. He greeted Milan, and I inferred that they knew each other well. The haulier then asked Milan what the increased stress on incompleteness meant. Milan explained that they needed to monitor the percentage of the appliances that were not complete. He added that in most cases, one can recognize it when seeing it. The haulier opposed and mentioned that when it was a motor of washing machines, you did not have to see it. He further asked, a bit irritated: "So does it mean I have to flip every washing machine?" His facial expression clearly indicated that it made no sense to him.

The everyday practices of measuring were affected by several factors, such as measuring tools, the conditions of measurement, or the approach of workers, and could lead to various results. As Stefan Laser (2020: 229) aptly points out: "Accounting here does not mean that the recycler 'finds' or 'discovers' numbers or fixed relations that are just waiting to be revealed." In that sense, I claim that numbers are made. Laser further

refers to Michel Callon (1998: 23), who mentions: “The most interesting element is to be found in the relationship between what is to be measured and the tools used to measure it. The latter do not merely record a reality independent of themselves; they contribute powerfully to shaping, simply by measuring it, the reality that they measure.” Although they both refer to the more abstract tools of measurement in economics, their conclusions can be applied to the context of manual measurement. The measuring of e-waste highlights the physical process of making numbers. This way of daily formation of numbers contributes to knowing e-waste that significantly differs from the one created from a distance in the offices on the displays of computers.

The numbers can indicate various inconsistencies, but it is challenging to reveal incompleteness without having some reference numbers. These are created by different types of testing, such as sampling or batch testing. To make those numbers trustworthy and reflective, Gamma requires reporting of incompleteness. The reporting means an increased workload for collection yards, hauliers, and recyclers. When Milan came back from the company where they mostly disassemble refrigerators and where he discussed the incompleteness, Albert asked him how they recognised it. Milan explained that they checked it by weight. With some microwave ovens, it was easy to tell that somebody dismantled them just by looking at them. With others, lifting them to feel their weight was necessary, and then it became immediately evident because an incomplete oven was heavier on one side. Incomplete washing machines were recognizable only when they were missing a motor. However, sometimes the motor was replaced by construction debris, so one could not check it only by weight. A missing power supply cord might be a clue, but employees of collection yards usually cut those out in any case. Gamma’s administrators were well aware of the difference between the emergence of knowing at their offices and in the yards of the recyclers; therefore, they felt motivated to go into the field.

In the yards, bodily proximity allows for other ways of knowing that exceed and extend the understanding of the abstract dimension of numbers. Waqas Butt (2023), who observed the informal waste workers in Lahore, Pakistan, focused on the intimate way of understanding the attributes of waste materials. Quality cannot be weighed but requires “the cultivation of certain habituated capacities” (ibid.: 544). These capacities to recognize the missing parts of e-waste are not self-evident. The informal waste

workers in Lahore differentiated three types of plastics. To identify the distinction in the physical qualities of those materials, they used the technique of tapping. “Tapping operated as a practical, embodied way of knowing and working with waste materials” (ibid.). Weighing the appliances in one’s hands also represented the “embodied way of knowing.” In relation to the quantity and numbers, the collection yard workers, the hauliers, and the workers at the e-waste processing company were developing an even more nuanced way of knowing: “approximate knowledge of quantity” that is “grounded primarily in visual and tactile senses, [and] may provide resources for including quality in quantification or may correct official numeric representations” (Sosna, Stehlíková, and Mašek 2024: 17). These ways of knowing also require some increased efforts in the daily practices that not everybody is eager to develop.

The knowing of incompleteness collided with the attitudes of those in close physical contact with the appliances. The hauliers and collection yard workers had a rather reserved stance on incompleteness. The collection yard workers explained that they had to accept everything, so they were almost powerless. Others approached it as a nuisance. Alena, a young and very kind regional manager, once told me about her experience when I joined her in visits to the collection yards. When she asked one worker for the solving of the incompleteness, he replied: “Don’t piss me off with this bullshit! I have everything one hundred per cent complete, and I lock the container.” Similarly, the hauliers mostly reacted irritably to the challenge of turning every washing machine upside down. They complained that it was not possible under the time pressure during loading. Incompleteness represented an annoying aspect in the lives of those dealing with e-waste daily.

The incompleteness of electrical appliances is almost impossible to infer from the weight of collected e-waste. Only in relation to other numbers, such as what Day et al. (2014: 128) call “numbering” as “apparently endless ways of being and having relations,” can one discern some tensions. Despite the potential of incompleteness to remain undetected, it considerably impacts quantification. The collection yard, or more precisely the municipality, then has a lower filling of containers, which decreases the benefit it gets from Gamma. Similarly, the haulier transports half-empty containers. The materials that the recycler can extract from appliances are less valuable. Finally, the company operating in the compliance take-back scheme fails to meet the annual

collection rate targets when reporting to the Ministry of Environment. Incompleteness as a specific issue in e-waste recycling demonstrates the embeddedness of quantification in the relations that emphasize the sensual and tacit processes. Zooming in and out with the numbers (Day, Lury, and Wakeford 2014: 131–32) necessarily involves embodied experience, "approximate modes of knowing quantity" (Sosna, Stehlíková, and Mašek 2024: 4), and "certain habituated capacities" (Butt 2023: 544) of recognizing incompleteness by weight, as well as batch tests relying on the physical work of disassembly and weighing. This work can be demanding and heavy, unlike numbers that are its result.

Systems of measurement

It was only the second week I worked at the e-waste processing company EREDA when the supervisor came to the sorting line to inform us that the company would go through batch tests next week. She emphasised that all of us are novices who don't have any experience with the tests. She explained that these tests occur every two years, and the collective systems require them. The collective systems want to see what the recovery ratio of each material is. It means we will first sort washing machines, then dishwashers, vacuum cleaners, microwave ovens, and ovens. For this reason, the other workers and the foreman selected, for example, fifty washing machines. They will weigh them, then put them into the shredder, from where the crushed washing machines will go to the sorting line. Here, the sorted materials will be weighed. She appealed to us not to be rash and not to throw the materials from these selected appliances into the containers with this material before it was weighed. We should always wait and follow the instructions of the auditor. After raising our concerns, she added that we should not get stressed. It was crucial to be calm and thorough. If something was wrong, she said, the company could have lost the certification WEEELABEX. It would be a problem because some of the company's clients, the material purchasers and suppliers of e-waste, require it from EREDA.

The batch tests represented a special occasion in the company's everyday stereotypical rhythm when the recovery ratio of singular appliances was measured. Its importance increased due to the risk of undesirable consequences in the case of negligence. Apart from being the way how to obtain the required certification, the batch

tests represented one of the systems of measurement in e-waste recycling. Together with sampling and container filling, these systems of measurement contributed to the creation of the reference numbers. As I showed in the previous section, the reference numbers were crucial to detecting incompleteness or other inconsistencies from a distance. I think about these measurement systems together with Catherine Alexander and Patrick O'Hare (2023: 436) from the perspective of the technologies of knowing and unknowing. The processes of measurement and weighing assume a particular object, and due to the various decisions made in these processes, these objects are reduced to numbers. Therefore, Alexander and O'Hare emphasise the aspects affecting the systems of measurement. They mention:

> "First, however, there has to be a thing to which the techniques of measurement can be applied, although wastes and pollution are notoriously wayward, prone to seeping through soil, tracking along aquifers, or dispersing through air. Once the waste object of knowledge is evoked, the second step of defining through measurement involves bounding it, which implies an act of framing or separation. Immediately, the politics of identifying what is to be measured become apparent, since framing means exclusion as much as inclusion. […] Thus, the very object that is wasted or contaminated can become an essentially contested terrain. Just as, in some cases, knowing and unknowing are simultaneously co-produced, so selecting units of measurement and assessment serves to make something known (from one perspective) and unknown in the same act."
> (Alexander and O'Hare 2023: 436)

Keeping in mind the inevitable way of how the measuring is brought to the practice that leads to highlighting some realities whilst concealing others, I ask what the systems of measurement used in e-waste recycling focus on and what they left behind.

The systems of measuring are closely linked with how money flows from and to the collective systems. I look specifically at the case of Gamma. Gamma pays collection yards and hauliers for their services based on the weight of collected or transported appliances. Gamma's payment for e-waste processing is a bit more complicated. Once a year, Gamma conducts batch tests in all cooperating e-waste processing companies.

Through these tests, the proportion of individual materials that can be extracted from each type of appliance during disassembly is determined in each processing facility. Then, the containers transporting the discarded electrical appliances are weighed, and a visual examination determines how many washing machines, dishwashers, and other appliances fit into one container. Once a month, Gamma conducts a competition to sell materials that have been obtained. If the delivered appliances were incomplete, Gamma's and the recycler's gain would be lower. When the e-waste processing facility does not report incompleteness, it must pay the financial loss. Based on the batch tests and container filling, the processing companies also get a monthly flat rate for processing from Gamma.

Collection and transport are carried out in containers or hauliers' trucks as bulk appliances. This containment in containers or truckloads is crucial for measuring and obtaining data (MacBride 2022: 176). Gamma offers specifically designed containers for use in every larger collection yard. When the collection yards do not have a container from Gamma, the haulier loads the truck with bulk appliances. In both cases, the goal is to have the containers or trucks as full as possible to minimize expenditure on transport. As the hauliers put it, they do not want to "transport the air." Filling the containers (*naplněnost kontejnerů)* is the responsibility of the workers of the collection yards, who can get a bonus for a higher filling. Although the filling as physical quality refers to the volume, Gamma sets the average total weight of a container with electrical appliances, based on their long-term monitoring, at 4,3 tonnes. Thus, weight presents a vital tool for commensuration. However, it conceals other properties of e-waste, such as incompleteness. In the logic of global commodity chains, containers represent crucial vehicles for keeping capital in motion (Birtchnell, Savitzky, and Urry 2015: 3; Leivestad and Markkula 2021: 3). To maximize the movement of capital, the spatial capacity of containers must be maximally used. Incomplete appliances cause insufficient density in filled containers as measured by weight.

Other essential data were gained by batch testing. According to the new Act on End-of-Life Products,[52] all e-waste recyclers must be certified by the auditor who received the certificate from the certifying authority. The certifying authority must hold

[52] Act no. 542/2020, Act on End-of-Life Products (*Zákon o výrobcích s ukončenou životností*). § 69 Povinnosti zpracovatele odpadních elektrozařízení (Obligations of the WEEE recycler), 2.c)

accreditation issued by the Czech Institute for Accreditation. The only certifying authority was the WEEELABEX Organisation; therefore, the certificate that guaranteed that the company proceeded under CENELEC[53] standards was colloquially called Weeelabex. Gamma required the certificate from their contractual recyclers even before its anchoring in the law. The main condition for getting the certificate represented the results of batch tests. It was necessary to achieve demanded rates in the proportion of singular sorted materials from a disassembled appliance. I got an opportunity to participate in batch testing from two different perspectives. First, I experienced it as one of the workers who sorted the crushed appliances at the sorting line at EREDA. Second, two years after this experience, I underwent the tests with the representative of Gamma, the Weeelabex auditor, and the chief manager of EREDA. It allowed me to observe that acquiring the certification included other aspects, except for batch tests, such as occupational safety, appropriate storage space, and composition of the e-waste.

Figure 11 The crumpled e-waste at one of Gamma's contractual recyclers.

[53] European Committee for Electrotechnical Standardization

During an audit at one of Gamma's contractual recyclers, I followed Dominik and the auditor heading to the pile at the other end, where I could see the various electrical equipment that looked crumpled (Figure 11). We were at the yard of the e-waste processing company and scrapyard in one and observed the batch tests carried out by the auditor. Dominik and the auditor were talking about something. From their dialogue, I caught that the auditor expressed his disapproval of the layout of e-waste. He noted that the recycler should have the electrical appliances separated and not mixed, as seen here. I asked why they were so crumbled. Dominik explained that it was because they took it by grab. Later, when we returned to the workshops, I noticed several fridge bars. I asked whether they should be here. Dominik nodded approvingly. The auditor asked the director whether they accepted these cooling appliances without the oil and coolants. The director admitted outright that a little oil was left, and they just disassembled it. The auditor pointed out that the compressors from the cooling appliances should be maximally drawn off. Apart from that, they should not handle them. Further, the auditor stopped in one storage space because he found out that there were air conditioners. He tried to weigh one of them in his hands and reckoned that there were around 3,5 kilos of oil, which was not drawn off. He added that it was enough for thirty thousand kilometres. This note related to his previous lamenting over everybody discussing how cars are environmentally unfriendly, but nobody caring about the air-conditioners. The vehicle could ride several thousand kilometres from the left amount of oil in air-conditioners. Using this example, he tried to depict the disparity between the harmfulness of these machines and the public debate devoted to them.

The compressors that are often stolen and lead to incompleteness might also pose a risk when the electrical appliances are delivered to the recyclers in a complete state. The auditor partially tolerated the presence of compressors in the company mentioned above because it was not only an e-waste recycler but also a scrapyard purchasing the scrap metal. Moreover, the e-waste was disassembled manually there. It meant that the presence of toxic substances could be discovered and monitored. Less permissive was the auditor towards EREDA, where the appliances were crushed in the shredder. It brings me back to my experience of batch tests as an employee of the e-waste processing company.

Whenever my co-workers and I came to the weighing machine with the buckets of sorted materials, the auditor asked what we disassembled. An interesting situation occurred when we disassembled washing machines and weighed the motors. At one moment, the auditor declared that it should not be here and pointed at one piece in the crate, which seemed quite like the others. He said that probably it must have slipped through. He clarified that it was a motor with a compressor. The chief manager claimed with a guilty smile that it had to be from a dryer in Bohemia.[54] He continued clarifying: "The people in Moravia do not have dryers, not even me." He hoped this explanation would convince the auditor that this was an exceptional situation. I assume, however, that the auditor was not satisfied with that response. When the grab was scooping up the appliances, there was no room to check the nature of each one (Figure 12). The dryers, together with the compressors containing toxic substances, could therefore have gone unrecognised.

Figure 12 The grab scooping up the washing machines.

[54] Czechia is divided into three areas: Bohemia, Moravia, and Silesia.

Systems of measurement—container filling, sampling, batch testing—provided the collective system with sufficient reference numbers referring to a weight that could be easily commensurate and, as such, served to monitor the correctness of procedures and guarantee the justified flow of money. Altogether, the reference numbers gained by the systems of measurement were able to alert Gamma's workers on suspicious activities or incompleteness. However, the processes of batch tests show that the risk can also dwell in completeness. These risks may be more complicated to detect on the basis of numbers alone. The collective system could reveal these risks only while performing the systems of measurement. Thus, the attention paid to these risks was lower than to incompleteness, which represented a more significant problem and also showed up later in the flow of money.

Flexibility of numbers

In January 2023, one of the collective systems published information about the results of e-waste collection from the previous year on their website under the title: "The collective system announces record-breaking outcome – company collected 37,450 tonnes of discarded e-waste in 2022." Except for the amount of collected e-waste, the report informed that "in seventeen years of the company's existence, the collective system collected and handed over to the contractual recycler 356 thousand tonnes of obsolete electronics that makes roughly 27 million of pieces of electrical appliances. For an easier picture – the weight of the collected e-waste is equal to the weight of 49 Eiffel towers (note – the metal construction of the Eiffel Tower weighs 7,300 tonnes) or to the weight of 2,034 Petřín observation towers or 925 Pendolinos."[55] I had to smile when I read this information for the first time. I could not even remotely imagine what these numbers mean. I also appreciated the effort of the article's author, who anticipated the reader's lack of imagination and tried to help with a series of comparisons. Still, I did not find them much helpful.

Numbers have the potential to convincingly demonstrate the results with a positive impact on the environment due to their performative properties (see Verran 2013). When searching for information about e-waste, most of the data will include the numbers as an informative category. We use the numbers instantly and without a doubt

[55] The numbers have been altered.

as if they would express crucial information about reality. And to some extent, they do so, but their understanding is not easy (Sosna, Stehlíková, and Mašek 2024: 2). In this case, the numbers are mainly used as representation. Their goal is to persuade. They should represent the performance of the company. Although the representation is playful and involves several expressions of the same, it does not contribute to the actual understanding of e-waste collection. The important information is missing: how many electronics were placed on the market in these years, what was the proportion of the collection towards the production, and what happened to the collected e-waste? This report does not offer answers to these questions. It rather seems that the author tries to astonish the reader with the considerable numbers. What is the message beyond the numbers?

The inclination towards numbers and their reporting fit in the broader forms of reporting and monitoring within state policies. Any collective system is obliged to collect discarded electrical and electronic equipment. According to Directive 2012/19/EU of the European Parliament and the Council on Waste Electrical and Electronic Equipment, the collection rate was in 2019 for most of the member countries 65% of the average weight of Electrical and Electronic Equipment (EEE) placed on the market in the three preceding years. The Czech Republic and some other European countries[56] were obliged to fulfil this collection rate only in 2021 "because of their lack of the necessary infrastructure and low level of EEE consumption." The Czech government prepared the Waste Management Plan of the Czech Republic for 2015–2024, which states the collection rates for particular years. In 2018, the collection rate was set at 50%. Alpha indicated on its website that it "over-achieves collection targets requested by the EU." According to the Ministry of Environment Report (2020), Alpha's collection rate was 67,4% in 2018, exceeding the second-highest rate of Beta (58,6%) by almost ten percentage points. The collection rate of other collective systems averaged 40%. Therefore, Alpha's collection rate raises suspicions.

In 2018, the Czech Environmental Inspectorate imposed a fine on the collective take-back system Alpha due to incorrect data in the annual report on the number of light sources placed on the market. Delta, the other collective take-back system, probably

[56] These included Bulgaria, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovakia, and Slovenia (Directive 2012/19/EU, Article 7, 3).

pointed out this case. Alpha and Delta were responsible for collecting and recycling light sources. They took fees from the light sources' producers according to the number of devices sold. From this sum of money, they fund collection and recycling. The producers transmitted data on products placed on the market to the collective systems. The collective systems should further state these data in the annual report on end-of-life products submitted to the Ministry of Environment. Alpha falsified the data from producers and demonstrated only part of the products launched at the market. I assume that in the upshot, Alpha performed care for the state when it ensured that the numbers reported would fulfil the requirements set by the EU. This type of care has, however, uncertain outcomes.

Before the new Act came into force on January 1, 2021, the fulfilment of the collection limits laid on the EU member states and not directly on producers or collective systems. When I searched for the information about Alpha falsifying the statistics, it proved hard, even impossible, to trace it. The only available information was in the Czech Environment Inspectorate's annual report and the professional journal on waste topics in the Czech Republic, in which the representative of the competing system Delta emphasised this case. The information on this topic seems to be absent in electronic sources. I believe that this absence may be partly due to the intention of the Ministry of Environment to mitigate the attention paid to this affair due to the efforts to achieve the targets on the e-waste collection rate set by the EU.

Communication in numbers leads to efforts to ensure a smooth dialogue. As Porter (1995: 77) reminds us, "The language of quantification may be even more important than English in the European campaign to create a unified business and administrative environment. It aims to supplant local cultures with systematic and rational methods." The lightness of kilos on paper is used for various modifications without having support in material reality. Gamma joins the producers who primarily sell household appliances characterised by heaviness. This property of sold appliances means the collected e-waste must also be heavier. It is one of the reasons incompleteness is a crucial issue in the collective system's agenda. Missing motors and compressors represent quite heavy parts of the appliances, creating ten to fifteen per cent of incompleteness. Thus, hypothetically, when the producers sell, for example, ten washing machines, the collective system would need to collect eleven to eleven-and-a-

half washing machines to fulfil one hundred per cent of the collection. Obviously, this is nonsense. First, considering this hypothetical example, it is unclear where the one-and-a-half washing machine should be taken. Second, the EU sets the collection rate to 65% of the average on the market in the last three years. The previous chapter showed that the collective systems will not collect more than the Act requires. Still, it becomes clear that incompleteness requires more effort from the collective system to fulfil these quotas.

Since 2016, the collection rate calculation in Czechia and the EU has changed. Instead of deriving the collection rate from kilos per inhabitant, it started to be measured as the percentage of the average amount of electronics placed on the market in the last three years. It created the opportunity for the collective systems to falsify the data about products placed on the market they received from the producers to provide the required collection rate. Simultaneously, it is fascinating to see how, from 2009 to 2014, the number of electronics placed on the market and collected e-waste was relatively stable, culminating between 166 and 182 thousand metric tonnes and 50 and 56 thousand tonnes (Ministry of Environment 2017). In 2015, the number of products placed on the market remained unchanged from the previous rate—182 thousand tonnes—but the amount of collected e-waste suddenly increased by eight percentage points. This increase seems suspicious because it occurred suddenly after five years. How was it possible?

The report of the Ministry of Environment clarifies that the increase was caused by the fact that the Act from 2014 clearly defined what entities are entitled to collect e-waste. This prevented e-waste from ending up classified as metal, construction, or demolition waste. Further, the increase in the collection was the consequence of the following aspects: the lower price for metals led to lower efforts to disassemble electronics and sell them as scrap metal; since 2015, collective systems started to take back incomplete electronics; collective systems invested into the collection infrastructure; and the statistics started to include also the e-waste collected outside the collective systems directly by some entities that are entitled to collect e-waste. Such changes in the legislation proved to be necessary steps for the Czech government to achieve the quotas required by the European Union. According to the WEEE Directive

2012/19/EU, these quotas were set as more than 40% of the average of electronics placed on the market in the last three years.

This example demonstrates how numbers are part of ecologies and how easily they can be extended to cover a broader range of aspects of reality. Moreover, it represents another example of how the numbers are made and how the measuring tools contribute to shaping them (Laser 2020: 229; Callon 1998: 23). Despite the ecologies, the numbers, as I showed at the beginning of this section, have the capacity to convey messages with slightly moralizing subtext. Here, the flexibility of numbers is used, on the one hand, to create moralizing discourses and persuasive comparisons and, on the other hand, to cover the breadth of possible measurements and ways in which numbers can be produced.

Summary

In interviews with directors of e-waste processing companies, a lack of confidence in the representation of the recycling system emerged. For example, I spoke with the ex-director of the e-waste processing company, who started working for the collective system. When talking about the cooperation between collective systems and e-waste processing companies that employ people with disabilities primarily, she stated doubtfully: "Sometimes, it is just on paper." Rostislav, the owner of a small processing facility, expressed a similar attitude and doubts about the company claiming to recycle plastics. He explained that it seems to be partially "*papírový podfuk*" (paper scam). This kind of distrust of things on paper turned out to be justified.

The doubts of actors in the e-waste recycling sector testify to the playful and creative use of numbers on paper and their dubious credibility. It relates to how easy it is to command and manipulate numbers when they are on paper or on the monitor's screen. I borrow the characteristics linked with physical weight—heaviness and lightness—as metaphors to notice the processes of measuring in both abstract and concrete ways. I think of numbers' capacity in this context as *lightness* that allows them to be free from all other contexts and relations and be variously overwritten, adjusted, or deleted. This lightness contrasts with the *heaviness* beyond the numbers that provide them with material support. Such heavy realities are defined by hard manual work, including lifting the washing machines to reveal incompleteness, struggling with

unreliable measuring tools, and undergoing a stressful audit linked with batch tests. An inevitable and essential part of heavy realities which produce numbers is control mechanisms designed to limit numbers' flexibility. This heaviness, including monitoring and systems of measurement together with the lightness of the numbers as representations, are necessary to keep the recycling sector economically efficient.

The stability and clarity that numbers usually maintain are also disturbed by the qualities of the materials to which the numbers refer. In e-waste recycling, such problematic quality is incompleteness, resulting in doubts about how numbers emerge and what they represent. Incompleteness also invites to closer human-material entanglement and registering the discarded electronics as individual things through the processes of monitoring and checking materials. This is something that distinguishes recycling from manufacturing.

Conclusion

Recycling refers to a process that includes the transformation of materials, their role, use, and value, but also to a sphere that is linked with these material processes. In this thesis, I introduced recycling as a sphere characterized by affection, dependencies, and moral and ethical beliefs. Except for representing "an economically productive enterprise" (Alexander and Reno 2012b: 15) driven by market logic defined by self-interested rationality and calculative reason, recycling constitutes a rich environment in which human-material entanglements may develop in many forms and acquire productive potential. Thus, on the one hand, recycling is linked with the imaginary of the right solution for the increasing amount of waste. On the other hand, the embeddedness of this sphere in market relations assumes an interference of logic that is accompanied by disparate interests and goals. This thesis contributes to the scholarship on recycling (Alexander and Reno 2012a; MacBride 2013; Crang et al. 2013) that addresses the global trajectories of materials, encounters of the global market with local concerns, or business interests of recycling companies by focusing on human-material entanglements to observe how recycling becomes economically efficient.

In this thesis, I dealt with two topics that offer two different scales. First, I examined how the recycling sector becomes economically efficient. Second, I focused on human-material entanglements and their moral and ethical embeddedness. I argued that by exploring human-material entanglements, it is possible to notice the less visible processes that make the recycling sphere economically efficient. This means that I approached human-material entanglement as an epistemological tool through which I could penetrate and better understand the processes that develop at the margins of market logic.

In the chapters, I explored the ways in which humans become entangled with materials and how these entanglements contribute to the economic efficiency of the recycling sector. I showed that market efficiency cannot be limited to cost-benefit analysis but needs to embrace specific human-material entanglements. Efficiency is a fundamental value for the market, and I revealed how the sector that is on the edge between being driven by self-interested rationality and calculative reason and by fulfilment of environmental and social responsibilities achieves efficiency through practical and material steps.

This thesis portrays the everyday practices of the people involved in the e-waste recycling sector at the collective system and e-waste processing company. These practices mingle with the trajectories of electronic and electrical equipment from the moment previous users throw them away. The trajectories of e-waste then vary depending on how the e-waste materials get entangled with humans. Thus, the trajectories might include being left behind on the street, stolen from the container, finding a new purpose in an e-waste processing company, getting a new life and value in somebody's house, or being disassembled into the materials that are further sold, dumped, incinerated, or transported to Pakistan. The thesis examines the moral and ethical entanglements of humans and e-waste materials. It shows their viability in the registers of value that ensure the stabilised conditions for e-waste recycling. This stability provides sufficient conditions for generating a profit and thus maintaining the system. The systemic aspect of state subsidies for employing people with disabilities, cutting the responsibilities of the stakeholders in the e-waste sector, and the lightness of numbers contribute to preserving recycling the way it is through the possibility of cheap labour, limiting the duties of stakeholders, and creatively treating their outcomes. This current state of stabilised conditions makes the e-waste sector economically efficient despite its shortcomings in the risks of environmental damage caused by stealing and other practices that might lead to the improper handling of e-waste materials. As long as these conditions persist, e-waste recycling has no reason to proceed to the circular economy in terms of the emphasis on clean production. The status quo is thus essential not only for the flow of capital but also for maintaining moral and ethical beliefs and strategies.

Moral and ethical questions permeate all sections of the e-waste recycling sector. The employment of people with disabilities in the sector that requires mostly stereotypical but also physically strenuous work shows that e-waste recycling is based on mutual dependencies. People with disabilities become dependent on the import of e-waste to guarantee their job positions. Simultaneously, the e-waste recyclers are dependent on employing people with disabilities since this constitutes cheap labour, thanks to the state subsidies. The first chapter looked at how disability and waste emerge as social categories. Dealing with humans and things that gained this social label makes visible the morally and ethically controversial decisions made by

companies operating in the e-waste sector, as was the case with Beta. Despite both these categories labelling something or someone that is vulnerable and does not achieve the qualities of normative ideal, my first chapter showed how these materials and these people regain their value through mutual entanglement.

The treatment of e-waste is embedded in a specific network of relations, which I called registers of value in the second chapter. These registers are characterised by environmental, social, political, and economic orientations and form the ways of knowing e-waste and practices concerning e-waste. The co-existence of the orientations can have a stabilising effect on the operations of the recycling companies. This stability then allows for freedom, particularly freedom of classification. The EREDA workers enact freedom in their everyday decisions about the fate of discarded electronics and their parts. The freedom of the classification process is further boosted by the character of waste as "a dynamic category" (Gabrys 2013: 16). The way how this freedom becomes materialised depends on experience and moral, sentimental, and trophy value. These factors enter the decision-making process and bring attention to the moral and ethical engagement of humans in the social life of things.

The classification freedom also gave workers space to consider how to handle electronics prior to their disassembly—to classify an object as suitable for further use, as I showed in the third chapter. The workers search for ways to make the functional devices useful and often take them home. To deal with this unethical act of stealing, the workers negotiate it morally and ethically and try to balance it with compensating activities such as concealment, justification, gift-giving, and sharing. The bodily proximity with the things condemned to extinction leads to the activation of moral and ethical thinking. In the conflict between the destruction of the functional devices and the unethical act of stealing, the workers look for ways to make their salvage decisions defensible.

The behaviour of EREDA workers when stealing functional devices and, similarly, the theft of e-waste from the containers that I described in the fourth chapter raises the question of responsibility for the technological products of human activity. Although the policy approach of Extended Producer Responsibility (EPR) makes producers responsible for the whole life cycle of their products, it is not accepted as limitless. I suggested understanding responsibilities in the plural, drawing upon Trnka

and Trundle (2017b). Inspired by Strathern (1996), I used the metaphor of cutting to analyse the moments when the limits to the responsibilities are formed. The moral and ethical beliefs and economic pragmatics affect the extent to which the responsibilities are fulfilled. The cutting then occurs in dependence on temporality and the ways of knowing. Temporality cutting occurs as a temporal mismatch between the payment for the new product and its recycling. The responsibilities are also cut along the ways in which the producers and the collective system know e-waste, which is primarily dependent on the economic desirability of the things.

The moral and ethical negotiations are loosened when dealing with numbers related to waste. The lightness of numbers and their handling allows for multiple ways of interpretation and use that might tempt manipulations. The lightness is made possible by the heaviness of hard work that contributes to the process of creating the numbers. The fifth chapter explored incompleteness, that is, the imperfection in the material properties of e-waste. Incompleteness shifts the focus from waste as mass to waste as individual pieces that must be examined piece by piece to determine if parts of the appliance are missing. Such imperfection makes numbers questionable and invites bodily proximity to the e-waste materials in order to discover the heavy realities beyond the numbers.

Recycling or circular economy?

The current setting of EPR policy implies efforts to achieve a circular economy and sustainable material loops when making producers responsible for the entire product life cycle. However, it fails to cover clean production. Instead, its main focus is still on recycling, which was, over previous decades, presented as the right way how to manage resources (Liboiron and Lepawsky 2022: 67). The other side of this green ideology (see Mašek 2020) is the fact that "recycling as currently practised enables waste and wasting" (Liboiron and Lepawsky 2022: 69). When ruminating on the possible shift to the circular economy, it is necessary to realise that recycling comprises a whole complex of humans and non-humans, machines and things, whose daily life are closely linked to recycling. Paradoxically, the established infrastructure demands more waste incessantly in contrast to the efforts to reduce waste production (Alexander 2016). Liboiron and Lepawsky (2022: 64) mention that the waste infrastructure and systems

are not necessarily inevitable, coherent and permanent. However, as I showed in the thesis, they have a strong material, social, and economic anchoring that makes their change challenging.

Although recycling is understood as the process when the materials from already used things are transformed into something else with the potential of value and presupposes preservation of the circle, it has almost no ambition to ensure the production of goods that will be less disposable, wasteful, and durable. With the EU's adoption of a new strategy for a circular economy plus the considerable amount of money designated for these purposes (O'Hare and Rams 2024b: 2), it is clear that the long-term plan is to achieve a fully circular economy respecting the processes of production as much as the processes of recycling, reuse, repair and refurbishment. While in the process of recycling, cases appear that strive to prevent waste, such as stealing the functional devices by the workers, they are not celebrated as the promise of a better future. Instead, they are morally and ethically burdened.

Silicon heaven?

The representation of e-waste recycling depicts only the numbers of e-waste collected, but the following processes are kept silent. Silicon heaven mentioned in the Red Dwarf series can thus be an excellent imaginary of what happens to the devices and appliances we used, cared for, or even related to, as these processes are hidden. However, with the collection, the social life of electronics does not end. They enter new relations and become useful again, or lose their original shape and value, or represent a burden in both mental and physical ways. When scaling down to the daily operation of a recycling company, from the perspective of workers, recycling seems to involve various processes of decomposition and destruction of value, more than its restoration. That is when the workers establish a relationship with the e-waste materials because they become aware of the presence of other people in the thing's emergence. Therefore, it might be valuable to think of processing companies as places of reflection on our relation to things and the people who are behind these things.

The newly published Global E-waste Monitor (Baldé et al. 2024) pointed out that recycling is insufficient to deal with the increasing amount of discarded electronics. However, that is not the only meaning recycling has. It has a significant role in the

imaginaries of people as the right way of dealing with waste and enabling our consumer lifestyle, and as a business that provides people with altered working capacity with relatively stable jobs. Rather than focusing on processing more waste, I believe it might be more beneficial to think about ways to keep e-waste alive while using the creative potential of people to re-design the products.

Based on my research, I can imagine several possible directions for further research or theoretical considerations concerning e-waste recycling when studied from the perspective of social anthropology or other social science. First, a more profound exploration of the financial flows related to recycling might elucidate the value creation processes. Second, the study of the governmental reports, policy papers of the state and the European Union, and strategical plans of other national and international stakeholders in the sphere of e-waste recycling could lead to the exploration of the discursive strategies and their shortcomings in this sphere. Third, in the sense of the "follow a thing" approach, the study of transnational flows of e-waste and its parts from and to Czechia would contribute to the scholarship on these mobilities. Fourth, the research among the actors operating within the sphere of the grey economy could reveal some other fails of the official system to cover the treatment of this type of waste. It would also contribute to the research conducted on this topic, mainly in the countries in Asia (Corwin 2018, 2020; Kirby 2019; Li et al. 2011), Africa (Little 2021; Oteng-Ababio 2012), and South America (Müller 2021).

Abstrakt

Elektroodpad mezi morálkou a etikou: odpadové praxe v České republice

Tato disertační práce zkoumá dopady sebestředné racionality a kalkulativní logiky trhu na recyklaci elektroodpadu (elektrický a elektronický odpad) a ukazuje, jak jsou konfrontovány jinými modalitami vztahů postavenými na logice péče, solidarity a představách sociální a materiální minulosti i budoucnosti. Argumentuji, že tyto vztahy vzájemnosti přispívají k ekonomické efektivitě sektoru recyklace elektroodpadu. Práce se dále zabývá tím, jak jsou obecná pravidla nastavená Evropskou unii s určitými politickými a ekonomickými cíli přijímána prostřednictvím lokálních způsobů porozumění a kreativity. Recyklace elektroodpadu v Čechách nabízí práci lidem s postižením tak, aby zvýšila svůj sociální kredit a ekonomický zisk v kontextu naplňování environmentálních cílů. Tato strategie však ztrácí svůj potenciál s technologickými změnami ve zpracování elektroodpadu. Tyto změny jsou doprovázeny neustálým bojem o dodávky elektroodpadu. Ti, kteří mají moc rozhodovat o elektronickém odpadu, se řídí spíše ekonomickými zájmy, než sociálními a environmentálními zodpovědnostmi. Abych porozuměla aspektům ovlivňujícím tato rozhodnutí, posouvám se v měřítku blíže ke každodenním praktikám a zaměřuji se na *entanglements* (propojení) mezi lidmi a elektroodpadovými materiály. Skrze Ingoldův přístup k materiálům jako součásti vztahů spíše než disponující sociální stránkou nazývanou materialita, se dívám na elektroodpad jako specifický typ materiálů, který aktivně zasahuje do vztahů s lidmi a stává se významným aspektem v morálním a etickém uvažování. Prostředí recyklace elektroodpadu spojuje lidi s postižením a s různými morálními a etickými přesvědčeními a vyřazené materiály, které nabývají nových druhů hodnoty. Na základě dlouhodobého etnografického výzkumu se zaměřuji na to, jak se sektor elektroodpadu vypořádává se sebestřednou racionalitou a kalkulativní logikou skrze každodenní morální a etické vyjednávání způsobů utváření vztahů s materiály a lidmi.

Bibliography

Alexander, Catherine (2016). When waste disappears, or more waste please!. *RCC Perspectives, OUT OF SIGHT, OUT OF MIND: The Politics and Culture of Waste*, no. 1, 31–40.

Alexander, Catherine, and Patrick O'Hare (2023). *Waste and its disguises: Technologies of (un) knowing*. Ethnos, vol. 88, no. 3, 419–43.

Alexander, Catherine, and Joshua Reno (eds.) (2012a). *Economies of Recycling. The global transformations of materials, values and social relations.* London and New York: Zed Books.

———(2012b). Introduction. In Catherine Alexander and Joshua Reno (eds.), *Economies of Recycling. The global transformations of materials, values and social relations.* London and New York: Zed Books, 1–32.

———(2020). Global entanglements of recycling policy and practice. In Mark Aldenderfer (ed.), *Oxford research encyclopaedia of anthropology.* Oxford University Press.

Alexander, Catherine, and Andrew Sanchez (eds.) (2019a). *Indeterminacy: Waste, value, and the imagination.* New York: Berghahn Books.

———(2019b). Introduction: the values of indeterminacy. In Catherine Alexander and Andrew Sanchez (eds.), *Indeterminacy: Waste, Value, and the Imagination.* New York: Berghahn Books, 1–30.

Alexander, Catherine, and Daniel Sosna (2022). Introduction. Thrift, Antithrift, Scale, and Paradox. In Catherine Alexander and Daniel Sosna (eds.), *Thrift and Its Paradoxes: From Domestic to Political Economy.* New York: Berghahn Books.

Anderson, Esther R. (2021). Positionality, privilege, and possibility: The ethnographer "at home" as an uncomfortable insider. *Anthropology and humanism*, vol. 46, no. 2, 212–25.

Arboleda, Martín (2020). *Planetary mine: Territories of extraction under late capitalism.* London, New York: Verso Books.

Atkinson-Graham, Melissa; Kenney, Martha; Ladd, Kelly; Murray, Cameron Michael, and Emily Astra-Jean Simmonds (2015). Care in context: Becoming an STS researcher. *Social Studies of Science*, vol. 45, no. 5, 738–48.

Baldé, Cornelis Peter; Kuehr, Ruediger; Yamamoto, Tales; McDonald, Rosie; D'Angelo, Elena; Althaf, Shahana; Bel, Garam; Deubzer, Otmar; Fernandez-Cubillo, Elena; Forti, Vanessa; Gray, Vanessa; Herat, Sunil; Honda, Shunichi; Iattoni, Giulia; Khetriwal, Deepali S.; Luda di Cortemiglia, Vittoria; Lobuntsova, Yuliya; Nnorom, Innocent; Pralat, Noémie, and Michelle Wagner (2024). *The Global E-waste Monitor 2024*. Geneva/Bonn: International Telecommunication Union (ITU) and United Nations Institute for Training and Research (UNITAR).

Baldé, Cornelis Peter; Forti, Vanessa; Gray, Vanessa; Kuehr, Ruediger, and Stegmann. Paul (2017). *The Global E-waste Monitor – 2017*. Bonn, Geneva, Vienna:

United Nations University (UNU), International Telecommunication Union (ITU), and International Solid Waste Association (ISWA).

Baldé, Cornelis Peter; Wang, Feng; Kuehr, Ruediger, and Jaco Huisman (2015). *The Global E-waste Monitor – 2014*. Bonn, Germany: United Nations University, IAS – SCYCLE.

Barnard, Alex V. (2016). *Freegans: Diving into the wealth of food waste in America.* Minneapolis: University of Minnesota Press.

Bauman, Zygmunt (2004). *Wasted lives: Modernity and its outcasts.* Cambridge: Polity Press.

———(2007). *Liquid times. Living in an age of uncertainty.* Cambridge: Polity Press.

Bernard, H Russell (2011). *Research methods in anthropology: Qualitative and quantitative approaches.* Lanham; New York; Toronto; Plymouth, UK: Rowman & Littlefield: AltaMira Press.

Birtchnell, Thomas; Savitzky, Satya, and John Urry (2015). Moving cargos. In Thomas Birtchnell, Satya Savitzky, and John Urry (eds.), *Cargomobilities: moving materials in a global age.* London: Routledge.

Blanchette, Alex (2020). *Porkopolis: American animality, standardized life, and the factory farm.* Durham and London: Duke University Press.

Blasco, Paloma Gay, and Huon Wardle (2007). *How to read ethnography.* London, New York: Routledge.

Blesk (2017) [online]. Kontejnery na elektro už nebudou zabíjet. Firma slibuje bezpečnější typ (E-waste containers won't kill anymore. The company promises a safer type). *Blesk.* Published: January 23. Accessed February 17, 2020. Available at https://www.blesk.cz/clanek/zpravy-udalosti/443295/kontejnery-na-elektro-uz-nebudou-zabijet-firma-slibuje-bezpecnejsi-typ.html

———(2018) [online]. Ukrutná smrt! Kluk (†17) z Opavy se udusil v kontejneru na elektroodpad, chtěl jen poslouchat hudbu (Cruel death! The boy (†17) from Opava suffocated in the e-waste container. He just wanted to listen to music). *Blesk.* Published: January 25. Accessed February 17, 2020. Available at https://www.blesk.cz/clanek/regiony-ostrava/520604/ukrutna-smrt-kluk-17-z-opavy-se-udusil-v-kontejneru-na-elektroodpad-chtel-jen-poslouchat-hudbu.html

Bowker, Geoffrey C., and Susan Leigh Star (1999). *Sorting things out: Classification and its consequences.* Cambridge, MA, London: MIT Press.

Boym, Svetlana (2007). Nostalgia and its discontents. *The Hedgehog Review*, vol. 9, no. 2, 7–19.

Butt, Waqas H. (2023). Accessing value in Lahore's waste infrastructures, *Ethnos*, vol. 88, no. 3, 533–53.

Callon, Michel (1998). Introduction: The embeddedness of economic markets in economics. *The Sociological Review*, vol. 46, no. 1 suppl, 1–57.

Callon, Michel; Méadel, Cécile, and Vololona Rabeharisoa (2002). The economy of qualities. *Economy and society*, vol. 31, no. 2, 194–217.

Carmody, Todd (2022). *Work requirements: race, disability, and the print culture of social welfare.* Durham: Duke University Press.

CENIA (Czech Environmental Informatiom Agency) (2005) [online]. *The Environment in the Czech Republic 1989–2004.* Prague: CENIA – Czech Environmental Informatiom Agency. Available at https://www.cenia.cz/wp-content/uploads/2019/07/Environment_in_CR_1989-2004-1.pdf

Ciocoiu, Carmen Nadia, and Valentina Târţiu (2012). The role of informal sector within WEEE management systems: A Romanian perspective. *Theoretical and Empirical Researches in Urban Management*, vol. 7, no. 1, 27–38.

Clifford, James (1983). On ethnographic authority. *Representations*, vol. 1, no. 2, 118–46.

Corvellec, Hervé; Stowell, Alison F., and Nils Johansson (2022). Critiques of the circular economy. *Journal of industrial ecology*, vol. 26, no. 2, 421–32.

Corwin, Julia E. (2018). "Nothing is useless in nature": Delhi's repair economies and value-creation in an electronics "waste" sector. *Environment and Planning A: Economy and Space*, vol. 50, no. 1, 14–30.

———(2020). Between toxics and gold: devaluing informal labor in the global urban mine. *Capitalism Nature Socialism*, vol. 31, no. 4, 106–23.

Crang, Mike; Hughes, Alex; Gregson, Nicky; Norris, Lucy, and Farid Ahamed (2013). Rethinking governance and value in commodity chains through global recycling networks. *Transactions of the Institute of British Geographers*, vol. 38, no. 1, 12–24.

Cross, Gary (2015). *Consumed nostalgia: Memory in the age of fast capitalism.* New York: Columbia University Press.

Cyrkl (n.d.) [online]. *O nás (About us).* Cyrkl.org. Accessed August 29, 2023. Available at https://cyrkl.com/en/about-us

Czech Social Security Administration (n.d. a) [online]. *Invalidní důchod (Disability benefit)*. Cssz.cz. Accessed April 20, 2021. Available at https://www.cssz.cz/web/cz/invalidni-duchod

———(n.d. b) [online]. *Invalidní důchod podrobně (Disability benefit in detail)*. Cssz.cz. Accessed April 20, 2021. Available at https://www.cssz.cz/invalidni-duchody-podrobne

ČAOH (The Czech Waste Management Association) (2014) [online]. *Jak je to s tržním prostředím u elektroodpadů? – dva zajímavé články Lidových novin (What about the market environment for WEEE? – two interesting articles from Lidové noviny)*. Published: January 27. Accessed February 21, 2020. Available at https://www.caoh.cz/aktuality/jak-je-to-s-trznim-prostredim-u-elektroodpadu-dva-zajimave-clanky-lidovych-novin.html

Černá, Michaela (2020) [online]. Rozjeli jsme Tinder pro odpadky, popisuje český startupista (We started Tinder for waste, describes Czech startup). *Forbes*. Published: February 12. Accessed August 29, 2023. Available at https://forbes.cz/rozjeli-jsme-tinder-pro-odpadky-popisuje-cesky-startupista/

Česká spořitelna (n.d.) [online]. *Nedostatek zdrojů: Recyklace II (aneb Kde je zlatý důl) (Resource Scarcity: Recycling II (or Where is the Gold Mine).* Csas.cz. Accessed January 13, 2023. Available at https://www.csas.cz/cs/firmy/articles/nedostatek-zdroju-recyklace-aneb-kde-je-zlaty-dul

Česká televize (Czech TV) (2013) [online]. *Chráněná dílna musí propouštět (The sheltered workshop must be laying off)*. Published: April 22. Accessed February 21, 2020. Available at http://www.ceskatelevize.cz/zpravodajstvi-ostrava/zpravy/223920-chranena-dilna-musi-propoustet/

Das, Veena (2012). Ordinary ethics. In Didier Fassin (ed.), *A companion to moral anthropology*. John Wiley & Sons.

Davis, John-Michael; Akese, Grace, and Yaakov Garb (2019). Beyond the pollution haven hypothesis: Where and why do e-waste hubs emerge and what does this mean for policies and interventions?. *Geoforum*, vol. 98, 36–45.

Davis, Lennard J. (1995). *Enforcing normalcy: Disability, deafness, and the body.* London, New York: Verso books.

Day, Sophie; Lury, Celia, and Nina Wakeford (2014). Number ecologies: numbers and numbering practices. *Distinktion: Scandinavian Journal of Social Theory*, vol. 15, no. 2, 123–54.

DeLanda, Manuel (2006). *A new philosophy of society: Assemblage theory and social complexity.* London: Continuum International.

DeLuca, Jaime R., and Callie Batts Maddox (2016). Tales from the ethnographic field: Navigating feelings of guilt and privilege in the research process. *Field Methods*, vol. 28, no. 3, 284–99.

Doherty, Jacob, and Kate Brown (2019). Labor laid waste: An introduction to the special issue on waste work. *International Labor and Working-Class History*, no. 95, 1–17.

Dunaway, Finis (2017) [online]. The 'Crying Indian' ad that fooled the environmental movement. *Chicago Tribune.* Published: November 21. Accessed December 16, 2023. Available at https://www.chicagotribune.com/2017/11/21/the-crying-indian-ad-that-fooled-the-environmental-movement/

Durkheim, Emile, and Marcel Mauss (2009). *Primitive classification.* London: Routledge.

Dunn, Elizabeth Cullen (2015). *Privatizing Poland: Baby food, big business, and the remaking of labor.* Ithaca, NY: Cornell University Press.

Durkheim, Emile, and Marcel Mauss (2009). *Primitive classification.* London: Routledge.

Editorial staff Euro.cz (2005) [online]. Zlato čeká v popelnicích (Gold waits in the bins). *Euro.cz,* Published: August 1. Accessed January 13, 2023. Available at https://www.euro.cz/clanky/zlato-ceka-v-popelnicich-876343/

Enviweb (2017) [online]. Řada obcí si mylně myslí, že je elektroodpad zlatý důl (Many municipalities mistakenly think that e-waste is a gold mine). *Enviweb.cz.*

Published: November 24. Accessed January 13, 2023. Available at https://www.enviweb.cz/110052

Eriksen, Thomas Hylland (2016). *Overheating: An anthropology of accelerated change.* London: Pluto Press.

Eriksen, Thomas Hylland, and Elisabeth Schober (2017). Waste and the superfluous: an introduction. *Social Anthropology*, vol. 25, no. 3, 282–87.

European Parliament (2020) [online]. *E-waste in the EU: facts and figures (infographic).* Published: December 23. Accessed May 20, 2024. Available at https://www.europarl.europa.eu/topics/en/article/20201208STO93325/e-waste-in-the-eu-facts-and-figures-infographic

Fair, Hannah; Schreer, Viola; Keil, Paul; Kiik, Laur, and Niki Rust (2023). Dodo dilemmas: Conflicting ethical loyalties in conservation social science research. *Area*, vol. 55, no. 2, 245–53.

Fassin, Didier (2012). Introduction: Toward a critical moral anthropology. In Didier Fassin (ed.), *A companion to moral anthropology,* John Wiley & Sons, 1–17.

Fine, Gary Alan (1993). Ten lies of ethnography: Moral dilemmas of field research. *Journal of Contemporary Ethnography*, vol. 22, no. 3, 267–94.

Fluehr-Lobban, Carolyn (2014). Ethics. In H. Russell Bernard and Clarence C Gravlee (eds.), *Handbook of methods in cultural anthropology.* Lanham, Boulder, New York, London: Rowman & Littlefield, 131–50.

Forti, Vanessa; Baldé, Cornelis Peter; Kuehr, Ruediger, and Garam Bel (2020). *The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential*. Bonn, Geneva, Rotterdam: United Nations University (UNU) / United Nations Institute for Training and Research (UNITAR) – co-hosted SCYCLE Programme, International Telecommunication Union (ITU), and International Solid Waste Association (ISWA).

Frederiksen, Martin Demant, and Ida Harboe Knudsen (2015). Introduction: What is a grey zone and why is Eastern Europe one?. In Ida Harboe Knudsen and Martin Demant Frederiksen (eds.), *Ethnographies of grey zones in Eastern Europe: Relations, borders and invisibilities.* London: Anthem Press, 1–22.

Gabrys, Jennifer (2013). *Digital rubbish: A natural history of electronics.* Ann Arbor: University of Michigan Press.

Garland-Thomson, Rosemarie (2002). Integrating disability, transforming feminist theory. *NWSA Journal*, vol. 14, no. 3, 1–32.

Gibson, James J. (1979). *The ecological approach to visual perception: Classic Edition.* Houghton Mifflin.

Gille, Zsuzsa (2007). *From the cult of waste to the trash heap of history: the politics of waste in socialist and postsocialist Hungary.* Bloomington: Indiana University Press.

———(2010). Actor networks, modes of production, and waste regimes: Reassembling the macro-social. *Environment and Planning A: Economy and Space*, vol. 42, no. 5, 1049–64.

Ginsburg, Faye, and Rayna Rapp (2013). Disability worlds. *Annual Review of Anthropology*, vol. 42, 53–68.

Gorz, André (1997). *Farewell to the working class: an essay on post-industrial socialism.* London: Pluto Press.

Graeber, David (2001). *Toward an anthropological theory of value: The false coin of our own dreams*. New York: Palgrave Macmillan.

Grauerholz, Liz; Barringer, Mandi; Colyer, Timothy; Guittar, Nicholas; Hecht, Jaime; Rayburn, Rachel L., and Elizabeth Swart (2013). Attraction in the field: What we need to acknowledge and implications for research and teaching. *Qualitative Inquiry*, vol. 19, no. 3, 167–78.

Greeson, Emma; Laser, Stefan, and Olli Pyyhtinen (2020). Dis/Assembling value. *Valuation Studies*, vol. 7, no. 2, 151–66.

Gregson, Nicky, and Mike Crang (2010). Materiality and waste: inorganic vitality in a networked world. *Environment and Planning A: Economy and Space*, vol. 42, no. 3, 1026–32.

Gregson, Nicky; Crang, Mike; Ahamed, Farid; Akhter, Nargis, and Raihana Ferdous (2010). Following things of rubbish value: End-of-life ships,'chock-chocky'furniture and the Bangladeshi middle class consumer. *Geoforum*, vol. 41, no. 6, 846–54.

Gregson, Nicky; Crang, Mike; Fuller, Sara, and Helen Holmes (2015). Interrogating the circular economy: the moral economy of resource recovery in the EU. *Economy and society*, vol. 44, no. 2, 218–43.

Gudeman, Stephen (2001). Scales, tales and tools. *Economic and Political Weekly*, vol. 36, no. 21, 1859–64.

———(2010). Creative destruction: Efficiency, equity or collapse?. *Anthropology Today*, vol. 26, no. 1, 3–7.

———(2016). *Anthropology and Economy.* Cambridge: Cambridge University Press.

Gustafsson, Johanna; Peralta, Julia Prieto, and Berth Danermark (2014). The employer's perspective: employment of people with disabilities in wage subsidized employments. *Scandinavian Journal of Disability Research*, vol. 16, no. 3, 249–66.

Guyer, Jane I. (2004). *Marginal gains: monetary transactions in Atlantic Africa.* Chicago, London: University of Chicago Press.

Hammersley, Martyn, and Paul Atkinson (2007). *Ethnography: principles in practice.* London, New York: Routledge.

Harvey, Penny, and Christian Krohn-Hansen (2018). Introduction. Dislocating labour: anthropological reconfigurations. *Journal of the Royal Anthropological Institute*, vol. 24, no. S1, 10–28.

Havlicek, Jakub (2021). *Imagining religion in the Czech Republic: Anthropological Perspectives.* Münster: LIT Verlag.

Hawkins, Gay, and Stephen Muecke (eds.) (2002). *Culture and waste: The creation and destruction of value.* Rowman & Littlefield Publishers.

Herza, Filip (2020). *Imaginace jinakosti: Přehlídky lidských kuriozit v Praze 19. a 20. Století.* Praha: Scriptorium.

Herzfeld, Michael (2015). Anthropology and the inchoate intimacies of power. American Ethnologist, vol. 42, no. 1, 18–32.

Hetherington, Kevin (2004). Secondhandedness: consumption, disposal, and absent presence. *Environment and planning D: society and space*, vol. 22, no. 1, 157–73.

Hird, Myra J. (2012). Knowing waste: Towards an inhuman epistemology. *Social Epistemology*, vol. 26, no. 3–4, 453–69.

———(2022). *A Public sociology of waste.* Bristol University Press.

INCIEN (2022) [online]. *Institut cirkulární ekonomiky mění vedení! (The Institute of Circular Economy is changing leadership!).* Incien.org. Published: September 1. Accessed August 29, 2023. Available at https://incien.org/institut-cirkularni-ekonomiky-meni-vedeni/

———(n.d.) [online]. *O nás (About us).* Incien.org. Accessed August 29, 2023. Available at https://incien.org/o-nas/

Ingold, Tim (2006). Rethinking the animate, re-animating thought. *Ethnos*, vol. 71, no. 1, 9–20.

———(2007a). Materials against materiality. *Archaeological Dialogues*, vol. 14, no. 1, 1–16.

———(2007b). Writing texts, reading materials. A response to my critics. *Archaeological Dialogues*, vol. 14, no. 1, 31–38.

———(2011). *Being alive: Essays on movement, knowledge and description.* London and New York: Routledge.

Jiménez, Alberto Corsín, and Rane Willerslev (2007). 'An anthropological concept of the concept': reversibility among the Siberian Yukaghirs. *Journal of the Royal Anthropological Institute*, vol. 13, no. 3, 527–44.

Keane, Webb (2019). How everyday ethics becomes a moral economy, and vice versa. *Economics: The Open-Access, Open-Assessment E-Journal*, no. 2019–9, 1–25.

Kennedy, Greg (2007). *An ontology of trash: The disposable and its problematic nature.* Albany: State University of New York Press.

Kirby, Peter Wynn (2019). Materialities meet the mangle: Electronic waste scavenging in Japan and China. *Geoforum*, vol. 102, 48–56.

Kirby, Peter Wynn, and Anna Lora-Wainwright (2015). Exporting harm, scavenging value: transnational circuits of e-waste between Japan, China and beyond. *Area*, vol. 47, no. 1, 40–47.

Kolářová, Kateřina (2012a). Disability studies: jiný pohled na „postižení ". In Kateřina Kolářová (ed.), *Jinakost-postižení-kritika: společenské konstrukty nezpůsobilosti*

a hendikepu: antologie textů z oboru disability studies. Praha: Sociologické nakladatelstvî (SLON), 11–40.

———(2012b) Tělesná jinakost, ne/způsobilost, "postižení", hendikep... k politice překladu a teoretickému vymezení pojmů. in Kateřina Kolářová (ed.), *Jinakost-postižení-kritika: společenské konstrukty nezpůsobilosti a hendikepu: antologie textů z oboru disability studies.* Praha: Sociologické nakladatelství (SLON), 41–63.

Krönes, Christian, and Florian Weigensamer (2018) [documentary movie]. Welcome to Sodom. Switzerland/Germany/Austria, 2018. 92 mins.

Kulick, Don, and Margaret Willson (1995) (eds.). *Taboo: Sex, identity, and erotic subjectivity in anthropological fieldwork.* London, New York: Routledge.

Labour Office of the Czech Republic (n.d.) [online]. *Sheltered job market (Chráněný trh práce).* Uradprace.cz. Accessed April 20, 2021. Available at https://www.uradprace.cz/chraneny-trh-prace

Laidlaw, James (2002). For an anthropology of ethics and freedom. *Journal of the Royal Anthropological Institute*, vol. 8, no. 2, 311–32.

———(2010). Agency and responsibility: perhaps you can have too much of a good thing. In Michael Lambek (ed.), *Ordinary ethics: Anthropology, language, and action.* New York: Fordham University Press, 143–64.

———(2018). Fault lines in the anthropology of ethics. In. Cheryl Mattingly, Rasmus Dyring, Maria Louw and Thomas Schwarz Wentzer (eds.), *Moral engines: exploring the ethical drives in human life.* New York, Berghahn Books, 174–193.

Lambek, Michael (2010). Introduction. In Michael Lambek (ed.), *Ordinary ethics: Anthropology, language, and action.* New York: Fordham University Press, 1–36.

Laser, Stefan (2020). Sorting, shredding and smelting scrap: The production of value by deformation at a high-tech recycler of electronic waste, *Valuation Studies*, vol. 7, no. 2, 221–55.

Latour, Bruno (1993). *We have never been modern.* Cambridge, MA: Harvard University Press.

Leivestad, Hege Høyer, and Johanna Markkula (2021). Inside container economies. *Focaal – Journal of Global and Historical Anthropology*, vol. 89, 1–11.

Lepawsky, Josh (2012). Legal geographies of e-waste legislation in Canada and the US: Jurisdiction, responsibility and the taboo of production. *Geoforum*, vol. 43, 1194–206.

———(2015). The changing geography of global trade in electronic discards: time to rethink the e-waste problem. *The Geographical Journal*, vol. 181, no. 2, 147–59.

———(2018). *Reassembling rubbish: Worlding electronic waste.* Cambridge, MA: MIT Press.

Lepawsky, Josh, and Charles Mather (2011). From beginnings and endings to boundaries and edges: rethinking circulation and exchange through electronic waste. *Area*, vol. 43, no. 3, 242–49.

Lévi-Strauss, Claude (1966). *The savage mind (La pensée sauvage)*. London: Weidenfeld & Nicolson.

Li, Binbin; Du, Huanzheng; Ding, Haijun, and M. Y. Shi (2011). E-Waste recycling and related social issues in China. *Energy Procedia*, vol. 5, 2527–31.

Liboiron, Max, and Josh Lepawsky (2022). *Discard studies: Wasting, systems, and power.* Cambridge, MA: MIT Press.

Lindhqvist, Thomas (2000). *Extended producer responsibility in cleaner production: Policy principle to promote environmental improvements of product systems.* Lund University.

Little, Peter C. (2021). *Burning matters: Life, labor, and e-waste pyropolitics in Ghana.* New York: Oxford University Press.

Lužný, Dušan, and Jolana Navrátilová (2001). Religion and secularisation in the Czech Republic. *Czech Sociological Review*, vol. 9, no. 1, 85–98.

MacBride, Samantha (2008). The immorality of waste: Depression-era perspectives in the digital age. *SubStance*, vol. 37, no. 2, 71–77.

———(2013). *Recycling reconsidered: the present failure and future promise of environmental action in the United States.* Cambridge, MA: MIT Press.

———(2022). Waste metrics from the ground up. In Zsuzsa Gille and Josh Lepawsky (eds.), *The Routledge Handbook of Waste Studies.* London: Routledge, 169–195.

Madden, Raymond (2010). *Being ethnographic: A guide to the theory and practice of ethnography.* Sage Publications.

Makovicky, Nicolette (2018). Kombinowanie: agency, informality, and the poetics of self in Highland Poland. *Journal of the Royal Anthropological Institute*, vol. 24, no. 3, 493–511.

Martínez, Francisco, and Patrick Laviolette (2019). *Repair, brokenness, breakthrough: ethnographic responses.* New York, Berghahn Books.

Marx, Karl (1990). *Capital: A critique of political economy.* London: Penguin Classics.

Mašek, Pavel (2020). "Čistě ekologicky": Autovraky, recyklace a morálka. *Biograf*, no. 71–72, 3–24.

———(2022). Grey greening: quiet sustainability at auto salvage yards. *Geografie*, vol. 127, no. 1, 55–73.

Mauss, Marcel (1973). Techniques of the body. *Economy and society*, vol. 2, no. 1, 70–88.

———(2016). *The gift. Expanded edition.* Chicago: Hau Books.

McMullen, Shannon; Zanotti, Laura, and H. Kory Cooper (2019). Electronic life histories: At home with e-waste waste materialities and meaning. *Worldwide Waste: Journal of Interdisciplinary Studies*, vol. 2, no. 1, 1–12.

Millar, Kathleen M. (2018). *Reclaiming the discarded: life and labor on Rio's garbage dump.* Durham and London: Duke University Press.

Miller, Daniel (2005). Materiality: An introduction. In Daniel Miller (ed.), *Materiality* . Durham and London: Duke University Press, 1–50.

Ministry of Environment (2017) [online]. *Vybrané ukazatele odpadového hospodářství v oblasti odpadních elektrických a elektronických zařízení za rok 2016 (Selected waste management indicators for waste electrical and electronic equipment for 2016)*. Waste Department. Available at https://www.mzp.cz/C1257458002F0DC7/cz/odpadni_elektronicka_zarizeni_nakladani_cr/$FILE/OODP-vybrane_ukazatele_elektrozarizeni-20171218.pdf

——— (2019) [online]. *Vybrané ukazatele odpadového hospodářství v oblasti odpadních elektrických a elektronických zařízení za rok 2017 (Selected waste management indicators for waste electrical and electronic equipment for 2017)*. Waste Department. Available at https://www.mzp.cz/C1257458002F0DC7/cz/odpadni_elektronicka_zarizeni_nakladani_cr/$FILE/OODP-vybrane_ukazatele_elektrozarizeni-19_08_2019.pdf

——— (2020) [online]. *Vybrané ukazatele odpadového hospodářství v oblasti odpadních elektrických a elektronických zařízení za rok 2018 (Selected waste management indicators for waste electrical and electronic equipment for 2018)*. Waste Department. Available at https://www.mzp.cz/C1257458002F0DC7/cz/odpadni_elektronicka_zarizeni_nakladani_cr/$FILE/OODP-vybrane_ukazatel_elektrozarizeni_2018-20200302.002.pdf

———(2023) [online]. *Vybrané ukazatele odpadového hospodářství v oblasti odpadních elektrických a elektronických zařízení za rok 2021* (*Selected waste management indicators for waste electrical and electronic equipment for 2021)*. Waste Department. Available at https://www.mzp.cz/C1257458002F0DC7/cz/odpadni_elektronicka_zarizeni_nakladani_cr/$FILE/OODP-vybrane_ukazatele_elektrozarizeni_2021-20230420.pdf

——— (2024) [online]. *Vybrané ukazatele odpadového hospodářství v oblasti odpadních elektrických a elektronických zařízení za rok 2022* (*Selected waste management indicators for waste electrical and electronic equipment for 2022)*. Waste Department. Available at https://www.mzp.cz/C1257458002F0DC7/cz/odpadni_elektronicka_zarizeni_nakladani_cr/$FILE/OODP-vybrane_ukazatele_elektrozarizeni_2022-20240422.pdf

Ministry of Labour and Social Affairs (2019) [online]. *Informace o minimální mzdě od 1. ledna 2020 (Minimum wage information from 1 January 2020).* Available at https://www.mpsv.cz/documents/20142/225504/Informace+o+MMe+od+1+ledna+2020+na+web+MPSV.pdf/51fb732f-1bcc-7947-b018-4346d1ca3631

Mol, Annemarie; Moser, Ingunn, and Jeannette Pols (2010). *Care in practice: On tinkering in clinics, homes and farms.* Bielefeld: transcript Verlag.

Mujezinovic, Davor (2020). *The global industrial metabolism of e-waste trade: A Marxian ecological economics approach.* Doctoral thesis. Lancaster University. Available at https://eprints.lancs.ac.uk/id/eprint/148940/3/Thesis_Resubmission_Davor_Mujezinovic.pdf

Müller, Juliane (2021). "Urban mining" in Bolivia: Global value chains of local electronic "waste". *Etnofoor*, vol. 33, no. 2, 41–56.

Munn, Nancy (1986). *The fame of Gawa: A symbolic study of value transformation in a Massim (Papua New Guinea) society.* Cambridge and New York: Cambridge University Press.

Musante, Kathleen (2015). Participant observation, In H. Russell Bernard and Clarence C Gravlee (eds.), *Handbook of methods in cultural anthropology.* Lanham, Boulder, New York, London: Rowman & Littlefield, 251–92.

Nagle, Robin (2013). *Picking up: on the streets and behind the trucks with the sanitation workers of New York City.* New York: Farrar, Straus and Giroux.

Narotzky, Susana (2018). Rethinking the concept of labour. *Journal of the Royal Anthropological Institute*, vol. 24, no. S1, 29–43.

O'Hare, Patrick (2021). Cambridge, Carnaval, and the 'actually existing circularity' of plastics. *Worldwide Waste: Journal of Interdisciplinary Studies*, vol. 4, no. 1, 1–12.

———(2022). *Rubbish belongs to the poor: hygienic enclosure and the waste commons.* London: Pluto Press.

———(2023). Creating waste and resisting recovery: Contested practices and metaphors in post-neoliberal Argentina. *Ethnos*, vol. 88, no. 3, 512–32.

O'Hare, Patrick, and Dagna Rams (eds.) (2024a). *Circular economies in an unequal world. Waste, renewal and the effects of global circularity.* London: Bloomsbury Academic.

———(2024b). Introduction – Circular economies. Between the promise of renewal and unequal global circulation. In Patrick O'Hare and Dagna Rams (eds.), *Circular economies in an unequal world. Waste, renewal and the effects of global circularity.* London: Bloomsbury Academic, 1–21.

OECD (2001). *Extended Producer Responsibility: A guidance manual for governments.* Paris: OECD Publishing.

———(2016). *Extended Producer Responsibility. Policy highlights. Guidance for efficient waste management.* Paris: OECD Publishing.

Okely, Judith (2007). Fieldwork embodied, *The Sociological Review*, vol 55, no 1 suppl, 65–79.

Oldenziel, Ruth, and Heike Weber (2013). Introduction: Recycling reconsidered. *Contemporary European History*, vol. 22, no. 3, 347–70.

Olsen, Bjørnar (2010). *In defense of things: archaeology and the ontology of objects.* Lanham; New York; Toronto; Plymouth, UK: Rowman & Littlefield: AltaMira Press.

Oteng-Ababio, Martin (2012). When necessity begets ingenuity: E-waste scavenging as a livelihood strategy in Accra, Ghana. *African Studies Quarterly*, vol. 13, no. 1–2, 1–21.

———(2020). Dispelling common misconceptions to improve policy outlook in developing countries. *Ghana Social Science Journal*, vol. 17, no. 2, 5–19.

Perkins, Devin N.; Brune Drisse, Marie-Noel; Nxele, Tapiwa, and Peter D. Sly (2014). E-waste: A global hazard. *Annals of Global Health*, vol. 80, no. 4, 286–95.

Pew Research Center (2017). *Religious belief and national belonging in Central and Eastern Europe.* Published May 10. Assessed December 20, 2023. Available at https://www.pewresearch.org/religion/2017/05/10/religious-belief-and-national-belonging-in-central-and-eastern-europe/

Porter, Theodore M. (1995). *Trust in numbers: The pursuit of objectivity in science and public life.* Princeton: Princeton University Press.

Postone, Moishe (1993). *Time, labor, and social domination: A reinterpretation of Marx's critical theory.* Cambridge: Cambridge University Press.

Prentice, Rebecca (2020). Work after precarity: Anthropologies of labor and wageless life. *Focaal – Journal of Global and Historical Anthropology*, vol. 88, 117–24.

Puig de la Bellacasa, María (2011). Matters of care in technoscience: Assembling neglected things. *Social Studies of Science*, vol. 41, no. 1, 85–106.

Rabinow, Paul (2009). *Marking time: On the anthropology of the contemporary* Princeton: Princeton University Press.

Rapport, Nigel, and Joanna Overing (2007). *Social and cultural anthropology: the key concepts.* London and New York: Routledge.

Reno, Joshua (2009). Your trash is someone's treasure: the politics of value at a Michigan landfill. *Journal of Material Culture*, vol. 14, no. 1, 29–46.

———(2014). Toward a new theory of waste: from 'matter out of place' to signs of life. *Theory, Culture & Society*, vol. 31, no. 6, 3–27.

———(2015). Waste and waste management. *Annual Review of Anthropology*, vol. 44, 557–72.

———(2016). *Waste away: Working and living with a North American landfill.* Berkeley: University of California Press.

———(2017). Wastes and values. In Daniel Sosna and Lenka Brunclíková (eds.), *Archaeologies of Waste: Encounters with the unwanted.* Oxford, Philadelphia: Oxbow books, 17–22.

Robbins, Joel (2013). Beyond the suffering subject: Toward an anthropology of the good. *Journal of the Royal Anthropological Institute*, vol. 19, no. 3, 447–62.

Sanchez, Andrew (2020). Transformation and the satisfaction of work. *Social Analysis*, vol. 64, no. 3, 68–94.

Scott, James C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed.* New Haven and London: Yale University Press.

Shakespeare, Tom (1998). *Disability reader: Social science perspectives*. London: Cassell.

———(2000). The social relations of care. In Gail Lewis, Sharon Gewirtz and John Clarke (eds.), *Rethinking social policy.* Sage Publications.

———(2006). *Disability Rights and Wrongs.* London: Routledge.

Sopranzetti, Claudio (2017). Framed by freedom: Emancipation and oppression in post-Fordist Thailand. *Cultural Anthropology*, vol. 32, no. 1, 68–92.

Sosna, Daniel (2017). Heterotopias behind the fence: Landfills as relational emplacements. In Daniel Sosna and Lenka Brunclíková (eds.), *Archaeologies of Waste: Encounters with the unwanted.* Oxford, Philadelphia: Oxbow books, 162–78.

———(2022). Saving and wasting: The paradox of thrift in a Czech landfill. In Catherine Alexander and Daniel Sosna (eds.), *Thrift and Its Paradoxes: From Domestic to Political Economy.* New York: Berghahn Books, 162–184.

———(2023). The inner dynamics of moral economies: The case of waste management. *East European Politics and Societies*.

———(2024). Circular economy of wastewater. Recirculation, spinning and rolling to the future. In Patrick O'Hare and Dagna Rams (eds.), *Circular economies in an unequal world. Waste, renewal and the effects of global circularity.* London: Bloomsbury Academic, 153–171.

Sosna, Daniel, and Lenka Brunclíková (2015). *Odpad pohledem společenských věd: metodická příručka.* Pilsen: Západočeská univerzita.

Sosna, Daniel, Barbora Stehlíková, and Pavel Mašek (2024). Ecologies of quantification in waste management: Landfilling, e-waste recycling, and car breaking. *Critique of Anthropology*, vol. 44, no. 1, 42–63.

Stamatopoulou-Robbins, Sophia (2019). *Waste siege: The life of infrastructure in Palestine.* Stanford: Stanford University Press.

Stowell, Alison F., and Samantha Warren (2018). The institutionalization of suffering: Embodied inhabitation and the maintenance of health and safety in e-waste recycling. *Organization Studies*, vol. 39, no. 5–6, 785–809.

Strathern, Marilyn (1996). Cutting the network. *Journal of the Royal Anthropological Institute*, vol. 2, no. 3, 517–35.

———(2010). Sharing, stealing and borrowing simultaneously. In Veronica Strang and Mark Busse (eds.), *Ownership and appropriation*. Oxford, New York: Berg.

Thompson, Michael (1979). *Rubbish theory: The creation and destruction of value* Oxford: Oxford University Press.

Trnka, Susanna, and Catherine Trundle (eds.) (2017a). *Competing responsibilities: The ethics and politics of contemporary life.* Durham: Duke University Press.

———(2017b). Introduction. Competing responsibilities: Reckoning personal responsibility, care for the other, and the social contract in contemporary life. In

Susanna Trnka and Catherine Trundle (eds.), *Competing responsibilities: The ethics and politics of contemporary life.* Durham: Duke University Press, 1–24.

Tsing, Anna Lowenhaupt (2013). Sorting out commodities: How capitalist value is made through gifts. *HAU: Journal of Ethnographic Theory*, vol. 3, no. 1, 21–43.

———(2015). *The mushroom at the end of the world: On the possibility of life in capitalist ruins.* Princeton: Princeton University Press.

Ureta, Sebastian (2016). Caring for waste: Handling tailings in a Chilean copper mine. *Environment and Planning A: Economy and Space,* vol. 48, no. 8, 1532–48.

Václavík, David; Hamplová, Dana, and Zdeněk R. Nešpor (2018). Religious situation in contemporary Czech society. *Central European Journal for Contemporary Religion*, vol. 2, no. 2, 99–122.

Váně, Jan, and Martina Štípková (2013). The national religious environment and the orthodoxy of Christian beliefs: A comparison of Austria, the Czech Republic and Slovakia. *Sociologický časopis/Czech Sociological Review*, vol. 49, no. 3, 403–25.

Verran, Helen (2010). Number as an inventive frontier in knowing and working Australia's water resources. *Anthropological Theory*, vol. 10, no. 1–2, 171–78.

———(2013). Numbers performing nature in quantitative. *Nature Culture,* no. 2, 23–37.

Widlok, Thomas (2016). *Anthropology and the economy of sharing*. London: Routledge.

Wylie, Gillian (2014). Human waste? Reading Bauman's Wasted lives in the context of Ireland's globalization. In Louis Brennan (ed.), *Enacting globalization: Multidisciplinary perspectives on international integration.* Palgrave Macmillan.

Ylä-Mella, Jenni; Keiski, Riitta L., and Eva Pongrácz (2015). Electronic waste recovery in Finland: Consumers' perceptions towards recycling and re-use of mobile phones. *Waste management*, vol. 45, 374–84.

Zigon, Jarrett (2010). Moral and ethical assemblages. *Anthropological Theory*, vol. 10, no. 1–2, 3–15.

———(2014a). Attunement and fidelity: Two ontological conditions for morally being-in-the-world. *Ethos*, vol. 42, no. 1, 16–30.

———(2014b). An ethics of dwelling and a politics of world-building: a critical response to ordinary ethics. *Journal of the Royal Anthropological Institute*, vol. 20, no. 4, 746–64.

———(2015). What is a situation?: An assemblic ethnography of the drug war. *Cultural Anthropology*, vol. 30, no. 3, 501–24.

———(2022). Truth, thinking, ethics. *Puncta: Journal of Critical Phenomenology*, vol. 5, no. 2, 87–104.

Zigon, Jarrett, and C. Jason Throop (2022). Introduction to the special issue: Dwelling in the contemporary condition. *Puncta: Journal of Critical Phenomenology*, vol. 5, no. 2, 1–7.