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Introduction

At the 24th Conference of the Parties (COP 24) to the United Nations Framework Convention on Climate Change (UNFCCC) in Katowice in December 2018, international media attention shone on the Intergovernmental Panel on Climate Change (IPCC) and its Special Report on the impacts of global warming at 1.5 °C (IPCC 2018a). The IPCC is accustomed to controversy following the publication of a report. However, this tug-of-war, over whether the latest report should be ‘welcomed’ or ‘noted’ (Allan et al. 2018: 28–29), was different. IPCC assessment reports are designed to update climate change knowledge and provide a collective basis for global negotiations at critical junctures in the UNFCCC process. This makes the organisation and the key findings of its reports objects of struggle for those wanting to delay political action. The media has often been used in these strategic attempts to undermine influential components of an assessment and its authors. The distinction between these criticisms and the struggle over the special report on 1.5 °C is that the world viewed this struggle at the site of climate negotiations and between government delegates (McGrath 2018).

As I set out to demonstrate in this book, the IPCC – as an organisation and an assessment practice – has always been shaped by the political forces of the global community’s response to climate change. The IPCC established global interest in climate change and, as such, is where the politics over the meaning and collective response to the problem began. And yet, the IPCC is rarely acknowledged and studied as science situated centrally in climate politics and politics as central in and to the IPCC’s formation and assessment of global climate change knowledge. IPCC scholarship increasingly documents the IPCC’s role in producing objects for negotiating action or for legitimating negotiated policy decisions within the UNFCCC (Fogel 2005; Lahn and Sundqvist 2017; Livingston and Rummukainen 2020; Lahn 2021, 2022; Beek et al. 2022; Cointe and Guillemot 2023). This scholarship evidences the effect of this role on climate knowledge production, the authorship of the assessment and on the intergovernmental approval of its

key findings (Petersen 2006; Hughes and Paterson 2017; Beck and Mahony 2018; Kouw and Petersen 2018; Livingston, Lövbrand and Olsson 2018; Pearce, Mahony and Raman 2018; De Pryck 2021, 2022). However, in this book, analysis begins from the IPCC as a central site in and producer of climate politics.

I came to understand the IPCC as situated centrally within and a powerful producer of climate politics through the project's central research question: who has the power to define climate change for collective response and what constitutes this power? As the organisation established and mandated to assess the latest knowledge on climate science, impacts and mitigation, the IPCC was the site to address this question. To find an answer, however, I had to look beyond the relationship between science and politics, which is central to scholarly interest in the IPCC. I too started here. However engaging with the sociology of Pierre Bourdieu (Bourdieu 1989, 1990, 1991; Wacquant 1989; Bourdieu and Wacquant 1992), forced me to situate the research question in broader global activity on climate change and study the IPCC in relation to social, political and economic interests in the problem and the struggles and forces these generate. From this starting point, the politics of climate change, the IPCC and its place negotiating a collective response look different from a model of knowledge provider for political action.

Bourdieu's notion of naming is key to how I redescribe the politics of climate change as a struggle to determine the meaning of the problem and thereby the response (Bourdieu 1986, 1991). For Bourdieu, these acts of naming are an attempt to 'fix forever' a set of power relations 'by enunciating and codifying' (Bourdieu 1986: 480). Carried within and by the name is the classificatory scheme of its origin (Bourdieu 1986). The classificatory schemes that the book interrogates are the cultural systems that determine the values and distribution of social, scientific, political and economic resources, which imprint on and in the name of climate change. Through this lens, the politics of climate change is a struggle over the social properties and material resources valued to order global relations and through which global relations are ordered. The IPCC is centrally placed within this struggle as the organisation authorised to assess the meaning and determine the practice – by whom, based on what forms of authority and through which set of activities – climate change is named. I describe the IPCC's practice of writing through the organisational actors, activities and forms of authority that have emerged over 30 years for the purpose of collectively naming this problem.

1.1 The IPCC as a Practice of Writing

The IPCC was established in 1988, with the task of assessing climate change divided between three working groups: the science (Working Group I (WGI)),

impacts (Working Group (WGII)) and response measures (Working Group (WGIII)). Historical accounts of the IPCC's formation have been informed by interest in the scientific processes and politics informing the collective response (Bodansky 1993; Hecht and Tirpak 1995; Agrawala 1998a, 1998b; Skodvin 2000a). In the study of international relations (IR), the epistemic community model has been most influential. This scholarship documents the emergence of a transnational community of scientists and the conferences and workshops through which scientific understanding was transferred to a policy audience and translated into policy recommendations (Lunde 1991; Boehmer-Christiansen 1994a, 1994b; Paterson 1996; Haas 2000; Newell 2000). It is the ascendancy of climate change on the political agenda, driven by the epistemic community and extreme weather events during the 1980s, that created the momentum for establishing an intergovernmental body to undertake an assessment of the state of knowledge on climate change. This established an organisation that contained both science and politics.

The epistemic community model was not designed to study an intergovernmental process that institutionalised science and politics for the production of usable knowledge (Haas 2004). For science and technology studies (STS) on the other hand, the intertwinement between science and politics in policy advice is a core focus, and the notion of boundary organisation is central to its study (Guston 2001). It is through STS concepts that much scholarly understanding and knowledge of the IPCC has been built. The notions of boundary organisation, boundary work (Gieryn 1983) and co-production (Jasanoff 2004a, 2004b) have unravelled the relationship between science and politics, documented the processes of translation between worlds and described the boundary work undertaken in bringing science and politics together and maintaining a demarcation in the organisation and its final products (Shackley and Wynne 1996; Shaw 2000, 2005; Siebenhüner 2003; Lövbrand 2007; Hoppe, Wesselink and Cairns 2013; Lidskog and Sundqvist 2015; Sundqvist et al. 2015). Re-telling the history of the emergence of climate change and establishment of the IPCC through the idiom of co-production in Chapter 2 brings to the fore the alignment between globalised knowledge and political order in how climate change became collectively known and institutionalised (Jasanoff 2004a; Miller 2004).

It is through the epistemic community literature and STS scholarship that I learned about the organisation I was studying. Holes began to appear in my grasp of this, however, during interviews. At first, it was a problem of a shared understanding, a sense that the interview respondent and I shared a framework for conceiving the IPCC, which kept the interview confined by what was known about the organisation at the time (Hulme and Mahony 2010). I revised the interview

questions and asked participants to describe in detail their role in the assessment instead. This proved helpful and I began to hear how an assessment report was put together. Then a second issue arose. I learned about tasks and activities that I struggled to locate in fields of science or politics. Some interview participants had academic backgrounds in climate science and related fields, but they were not producing knowledge and assessing literature as authors or overseeing the assessment as WG co-chairs, their role was intermediary and largely administrative and technical. In fact, on a day-to-day level, they appeared to be holding the whole exercise together. This left me with the sense that I did not know what I was studying. I decided that on the most basic level, my research needed to provide a detailed account of the IPCC as an organisation.

It was during a later interview that my understanding of what the IPCC *does* was confronted. I was left feeling very uncomfortable when, for the second time, I was impatiently referred to the IPCC rules and procedure, as if the answers to all my questions were contained in that document. The problem was, despite reading this document, I could not see its significance the way my participants seemed to. That was, until I observed the rules and procedures in the making. In October 2010, I travelled to Busan in South Korea to observe the 32nd Plenary of the IPCC. It is during these annual or bi-annual meetings that the actors that I had been interviewing – delegates, bureau members and technical support unit (TSU) staff – come together for four to five days of intergovernmental decision-making. Observing this meeting was critical to understanding the IPCC as a practice of writing and the importance of social order to how climate change is written through the process.

In some respects, this meeting and the organisation I saw through it was a reflection of a particular moment in the IPCC's history. It was after the publication of the fourth assessment report (AR4) in 2007 and in the early stages of the fifth assessment cycle. The IPCC came under intense pressure in 2009, when emails between IPCC authors at the Climate Research Unit at the University of East Anglia were hacked (Pearce 2010). The email conversations between authors of the assessment were used to cast doubt on the science of climate change. Criticism further intensified in 2010, when mistakes were discovered in the AR4 on the date given for the melting and disappearance of the Himalayan glaciers (Carrington 2010). In order to address this criticism, and re-establish the IPCC's authority as the leading international assessment body, the UN Secretary-General, Ban Ki-moon, and IPCC chair, Rajendra Pachauri, requested the InterAcademy Council (IAC) 'to conduct an independent review of IPCC processes and procedures used to produce assessments' (IAC 2010a: 7). It was at the 32nd plenary that the IAC review and recommendations were discussed by the panel, and the processes and procedures for producing assessment reports were re-formulated.

On observing this meeting, I began to conceive of the IPCC as a practice of writing, both in the sense of writing climate change in and through the assessment and writing the rules by which it will be written. This meeting also enabled me to observe that not all are equal in the writing of climate change, as it became apparent that not all actors present were immersed in the proceedings or impacting its outcomes. Compared to the size of the meeting space, there was a relatively small group of countries that were actively involved in the process of revising the organisational rules and procedures. This raised questions about an actor's capacity to invest and the properties that constituted the power to shape IPCC decision-making and its products. It is through the actors, activities and forms of authority framework that I systematically explore the social properties that order relations in the organisation and through the production of an international assessment of climate change.

Through this framework, I describe the IPCC as five units: the panel, the bureau, the TSUs, the authors and the secretariat. This approach opens analysis to all actors and forms of authority, regardless of whether it is designated as scientific, political, technical or administrative, as all of these activities are required to put together a global assessment of climate change. This approach makes it possible to explore the relationship between these activities and participation in the IPCC and the economic investment that becoming a symbolically powerful writer of climate change is dependent upon. Bourdieu's notion of capital is critical to this (Bourdieu 1986). To identify the properties distinguishing actors within the IPCC and to explore the relationship between this social order and the global distribution of resources, I retained Bourdieu's concept of capital.

Capital makes it possible to identify and unpack what constitutes authority within the panel, bureau, TSUs, secretariat and authorship of the assessment – the distribution of social, scientific, political and economic resources that govern an actor's access to, location within and influence over the organisation and its assessment practice. Although Bourdieu identified three principal types of capital – economic, cultural and social (Bourdieu 1986; Wacquant 1989, 1998) – the valued properties and their capacity to order relations in the IPCC had to be identified empirically through participant observation and interviews. To understand the symbolic power these forms of authority have in the IPCC's writing of climate change in the present, it was necessary to return to the historical emergence of the organisation. It was during the establishment of the IPCC in 1988 that the cultural foundations were laid, which in turn identified and distinguished the properties that would be organisationally valued and the actors that embodied these. I use the actors, activities and forms of authority framework to describe the social order at each stage of the assessment's production, from member government's decision to repeat the process (Chapter 5), the scientific assessment (Chapter 6)

to intergovernmental approval of the report's key findings (Chapter 7). It is by following the assessment report and mapping the social order of its conduct that the book addresses its central question and explores how the global order of relations imprints on and through the naming of climate change.

1.2 The Method of Data Collection

The conceptualisation of the IPCC as a practice of writing and the development of the actors, activities, forms of authority framework developed through in-depth empirical study over 15 years. There were several layers to my immersion in the organisation. I began with the reports themselves, reading the Summary for Policymakers (SPM), the chapter executive summaries and recording the names, affiliation and nationality of the authors for the first (1990), second (1995), third (2001) and fourth assessment reports (2007). This gave me a sense of disciplinary constructions of climate change, and I began to recognise the names of key actors that served on multiple assessments as authors and bureau members. I contacted these actors for interview and began interviewing in the summer of 2009. My approach to interviews changed rapidly in the beginning, when I was learning from each conversation and at the same time, struggling with the sense that I understood less about the organisation with every interview. It was the concern that my interviews were providing more data on what people thought about the organisation than what the organisation is and does that led me to attempt to immerse myself in the undertaking of an assessment as my respondents were. I began to ask interview participants to describe what they did, step by step, in the assessment, and from this, I began to build up a detailed picture of how an IPCC assessment report is made.

I have undertaken over 40 interviews in total and had many more conversations and email exchanges to check and refine the details of the IPCC's assessment practice. However, I could not have described the social order shaping these activities and their imprint on the final product without observation. I was increasingly hearing about the importance of the TSU in the assessment's production, and I expanded my field research to conduct further interviews and visit the TSU for WGII's contribution to the fifth assessment report (AR5) at the Carnegie Institution for Science at Stanford University. Later, in 2019, I also visited the WGIII TSU at Imperial College London during the sixth assessment cycle (AR6). During observation of the 32nd plenary of the IPCC in October 2010, I began to quantify the asymmetry in participation by logging and timing each intervention (see Table 4.2). After the meeting, I continued interviews, which became increasingly focused on the finer details of putting together an assessment and about the asymmetries observed during the plenary.

Since the initial PhD study of the IPCC, I have expanded data collection through collaborative research projects that have helped to provide further quantification

of asymmetries. This includes a social network analysis (SNA) of institutional affiliation and co-authoring patterns of WGIII authors in the AR5 (Corbera et al. 2016). One of the gaps from the initial interview data was that it was the view from developed country participants (see Appendix 1). To address this in a subsequent SNA-informed study, we designed and conducted a survey of AR5 WGIII authors to develop a more intricate understanding of the forms of authority ordering author relations in the assessment (Hughes and Paterson 2017). It became increasingly important to situate this data in the broader global knowledge landscape of the climate field. For this, I began to attend UNFCCC COP meetings, including COP 23 and COP 24, where I observed the formation of the Local Communities and Indigenous Peoples Platform. Then in January 2022, a successful grant application, initiated a more detailed study of the AR6.¹ This has included observation of WGII and WGIII's virtual approval sessions and observation at COP 27 in November 2022 and a Subsidiary Body meeting (SB58) in June 2023 to follow the dissemination of the AR6 and its uptake in the Global Stocktake.

The account provided of the IPCC's practice of writing climate change, the social order this is built upon and its imprint on the naming of climate change is informed by all forms of data collected through each stage of research. The book's detailed description of the organisation and its practice for putting together an assessment report is informed by and in reference to interviews, IPCC documentation, Earth Negotiation Bulletin (ENB) reports of meetings and the scholarly literature. In order to demonstrate quantitatively the asymmetries in participation, I use IPCC participant lists, author lists, government review comments and the ENB reports, as well as the IPCC's own studies and analysis of developing country participation. This enables me to provide a detailed and quantitatively supported study of who participates in IPCC meetings, what enables meaningful participation and with what effect for how we know and respond to climate change.

1.3 Contribution to Knowledge

By deconstructing the IPCC through the actors, activities and forms of authority framework and describing the practice of writing climate change I offer a novel way to understand this organisation and its place in climate politics. The book provides a detailed account of the historical emergence of the IPCC's practice of writing and the cultural properties that were valued to order relations, how this order imprints on IPCC products and how this order is challenged and changes over and through each assessment cycle. Through this account, I make a contribution to existing literature on the IPCC and the study of intergovernmental

¹ ESRC grant application on the Politics of Science in Climate Cooperation led by Patrick Bayer (University of Glasgow) and in collaboration with Erlend Hermansen (CICERO, Norway) (ES/W001373/1).

organisations more broadly. On a practical level, the book contributes to understanding the relationship between measures of authority and global resource distribution and its impact on developing country participation. The practical utility of this approach is that it identifies actors and activities by which social order can be challenged and developing country participation strengthened. This remains critically relevant to the IPCC and its place in the collective stocktake of the Paris Agreement, and to ensure that all new global knowledge bodies design for participation by all from the outset.

Understanding the IPCC as a practice of writing and disaggregating this practice into the actors, activities and forms of authority constituting it is inspired and underpinned by the sociology of Pierre Bourdieu. Bourdieu's scholarship has emerged as influential in the study of IR (Jackson 2009; Bigo and Madsen 2011; Leander 2011; Adler-Nissen 2013). It has left a particular mark in elevating the analytical significance of practice (Neumann 2002; Pouliot 2010, 2016; Bigo 2011; Drieschova and Buerger 2022) and in illuminating the culturally constituted symbolic forms that power takes (Williams 2007; Adler-Nissen 2013; Eagleton-Pierce 2013; Adler-Nissen and Pouliot 2014; Hughes 2015, 2023). From Bourdieu I learned how to study the making of social order (Bourdieu 1988, 1989, 1990, 1998). His analytical tools provided a unique way to isolate the IPCC as an organisation for internal study, while ensuring analysis is situated in broader social and political struggle over climate change. In identifying the actors that have the power to determine the meaning of climate change – the symbolic power – to name, and what constitutes this power, the book builds on existing Bourdieu-informed scholarship on authority (Sending 2015), symbolic power (Eagleton-Pierce 2013) and pecking orders (Pouliot 2016), while contributing to further systematic analysis of the properties of this power through the notion of capital.

In identifying the IPCC as a practice of writing, the book aspires to do what other authors in the study of IR and beyond have done through observation, ethnography and narrativisation of practice, that is, to show how organisational practices contribute to making the object of their activity (Riles 2000; Hull 2012; Raffles 2014; Sending 2015). As Hugh Raffles demonstrates through his account of the Amazon, the Amazon became an object of British life (and beyond) through the imperial scientific practices that aimed to establish it as a site of discovery and set out to record and claim it as such; practices that have and continue to shape both the nature and knowledge of the Amazon in tangible and lasting ways (Raffles 2002). Putting this into the context of international organisational life, Riles' study brings to light the role that information plays in bringing objects like 'the environment' and 'women' into existence, which also becomes the means by which they exist (Riles 2000: 179). Sending's study on peace building, on the other hand, illuminates how the content of these governance objects is also shaped by actor attempts to constitute and struggle over the authority to control and govern them (Sending 2015). The contribution I hope to make to these

studies of the duality of knowing and acting on through recording, gathering, networking and documenting is the systematisation of the study of power relations. This book aims to demonstrate concretely how these activities are marked by social order and how social order leaves its mark through these naming practices.

The analytical framework of the book makes it possible to document the extent of the involvement of member government in the IPCC's practice of writing climate change. The intergovernmental nature of the IPCC as a knowledge provider has been of interest to scholarship from the outset. The establishment of an intergovernmental body over a science-governed assessment process has been viewed as an attempt to gain control over climate science as it ascended the political agenda (Haas 2004). For actors within the IPCC and those observing it closely, the intergovernmental character and the involvement of member governments in the organisation and assessment practice, particularly during the approval of the SPM, guarantee the utility and impact of the knowledge base on climate negotiations (De Pryck 2022). However, the extent of member government involvement and the distribution of power in and over the practice for producing the assessment and its final outcomes have not been documented until now. This account describes the activities of member governments as focal points and delegates at each stage in the production of the assessment, which is particularly revealing at the start of the assessment when governments inform the direction and content of the next global report on climate change. As documented in Chapter 5, starting with the decision to repeat the process through the election of the bureau, scoping the report, commenting on drafts and approving the final outline, member governments are deeply invested in attempting to shape the content and limit the implications of the next report.

Describing the extent of member government activities required for meaningful and impactful participation in the IPCC's practice of writing begins to discern the dependent relationship between economic resources and symbolic power to write climate change. Participation in the IPCC is a resource-intensive process that requires significant economic and human resource investment over time. It is through fulfilling all the necessary activities and tasks as government delegates to the panel and national focal points to the organisation that the IPCC's practice of writing is learned, avenues for influence open and symbolic power is gained. This understanding provides the basis of exploring the continuing asymmetries between developed and developing country participation despite organisational efforts over 30 years to deepen engagement. Combined, the description of member government activities and the mapping of power relations make the IPCC an ideal teaching site for unpacking the relationship between science and politics and simulating the intergovernmental negotiation of the SPM. Alongside the book, I offer an outline for role playing the politics of approval to enable instructors to develop a lesson plan relevant to their particular setting and learning requirements. This is available on www.cambridge.org/hughes.

At the same time, the analytical framework of the book helps the reader to look beyond the focus and relationship between science and politics in present IPCC scholarship. In this approach, all actors, activities and forms of authority are subject to empirical study to determine their role in and influence over the IPCC's practice of writing. This identifies the TSUs that sit alongside the WG co-chair as critical in the realisation of the assessment. Through the everyday activities of scheduling, emailing, compiling, formatting and editing, actors within the TSU acquire the most intimate knowledge of the assessment and its progression. This is a valuable form of cultural capital, which translates into symbolic power in and over the writing of climate change, and the book explores who has access to these resources and how they are distributed within the panel.

This analytical approach has utility for studies of international organisations where generating knowledge and expertise is central to the organisational mandate. The power of the bureaucracy in the study of international organisations has been brought to the fore in the study of IR, challenging disciplinary conceptions of what actors and forms of authority matter (Barnett and Finnemore 1999). Within the study of global environmental politics, the influence of treaty secretariats has become an important area of study, and detailed comparison between these has been undertaken (Yamin and Depledge 2004; Bauer 2006; Depledge 2007; Biermann and Siebenhüner 2009; Jinnah 2014). This framework could significantly contribute to further opening up the black-boxed nature of the secretariat, as well as revealing what other units within the organisation undertake and compete for administrative tasks. Combined with the importance of learning the overriding practice and purpose of an organisation – as in the practice of writing – this approach could be particularly insightful in studying how the social order of an organisation is imprinted and re-made through the forms of expertise and organisational products it generates (Adler and Bernstein 2005).

The contents of the book have implications for the design of new knowledge bodies to inform treaty-making. The IPCC model has already proven influential in the design of other global assessment bodies, including the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) (Larigauderie and Mooney 2010). Negotiations are underway for the formation of a science-policy body on chemicals and waste (Wang et al. 2021), and the same is likely to arise in the newly negotiated agreement on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction (BBNJ) (Tessnow-von Wysocki and Vadrot 2020). If from the outset, the architects acknowledge that this body is and will be a site of politics and make meaningful participation by all a central objective, a body can and will be designed differently. I discuss the implications of the findings of the book for new science bodies in concluding the book in Chapter 8.

The book's account also reveals its limits and where future study can build on and develop understanding in advancing participation by all. This is most notable in relation to the struggle over the categorisation of developed and developing countries that begins with the approval of the outline in Chapter 5 and is documented through the politics of approval in Chapter 7. Through recounting these events, it becomes apparent that I am describing an order of relations that is not as it was when the IPCC was established in 1988. As the practice of writing reflects changing global order, so too must critical scholarship find the analytical means to record and illuminate these shifts. In the book, I use the IPCC's own categorisation of developed and developing countries to study participation. This proves effective in revealing the continued dominance of developed countries in the global knowledge economy and, by extension, the power of scientific culture to order relations in the authorship of the assessment. However, it also increasingly masks asymmetries within the developing country category, which is why some countries fought so hard to erase it from the assessment (Chapter 7). Future studies of the IPCC and climate politics more broadly need to find a way to carefully unravel these tensions and more productively understand and engage with the changing dynamics of participation in all agreement-making processes.

Relatedly, there is also a need to more strongly relate the order of relations in the practice of writing climate change to greenhouse gas (GHG) emissions, revenue from fossil fuels and dependence on fossil fuels. Sometimes in the struggle over scientific and technical details and the strategies deployed, the interests and interventions of the underlying drivers of member governments can become obscured. Research can help to make the apparently complex struggles simpler and contribute to rendering clearer what exactly countries are negotiating for (with what resource base) in climate agreement making and at what cost to all peoples and the planet.

1.4 The Journey of the Book

In this book, I hope to take you, the reader, on an intricate journey into the practice of writing climate change, the social order through which it is written and the imprint this leaves on how we know and act upon climate change. I begin this journey in Chapter 2, identifying some of the most important conceptual resources available in the study of environmental problems to address the central question of the book, namely who has the power to write climate change and what constitutes this power. This allows us to explore the early history of the IPCC from different approaches and models of the relationship between science and politics. By Chapter 3, however, it is apparent that the history of the IPCC's emergence can be re-told again through a Bourdieu-inspired approach, whereby climate politics is a

struggle to determine the meaning of the problem and the order of relations preserved or challenged through the name approved. This situates the IPCC centrally within global climate activity as the organisation authorised to write the meaning of climate change and the rules by which it can be written.

With the IPCC situated in the global field of climate activity and the forces this generates, I turn inward in Chapter 4 to the actors, activities and forms of authority that constitute this organisation and its practice of writing climate change. History is central to documenting the emergence of the social order within the organisation, and the chapter provides an account of how the IPCC has arrived at its present form. With a more intricate understanding of the organisation and the order of relations shaping it, the book begins its journey along the assessment production pathway from the decision to repeat the process (Chapter 5), through the scientific assessment (Chapter 6) to the politics of approving the report's key findings (Chapter 7). Following me on this intricate journey makes apparent the stakes for all in the IPCC's practice of writing climate change and the power of this order-making problem to make and shape politics in its name.