In this paper I will discuss the meaning of laboratory notebooks in science and in history of science by concentrating on an early Victorian “gentlemen specialists” practice of notebook writing, just at a time when a public discourse about how to accurately account for the often private and messy bench work events was initiated. Of particular interest is the numerical technique of keeping a “laboratory book” of James Prescott Joule written in the years between 1843 and 1858.¹ It captures the beginning of an intensive research period in which he contributed most importantly to effect a change in our understanding of the nature of heat and shows a specific mode of keeping an account of laboratory experiences. However, in order to provide a clearer sense for the historical significance of Joule’s mode of narrating by numbers we will briefly compare this practice with contemporary works of Charles Babbage and Michael Faraday. Michael Faraday’s detailed notebook entries have attracted the attention of historians of science for a long time and their investigations certainly have moulded our image of experimental investigations in this period. For our concerns here two characteristics of Faraday’s notebook writing are important to mention, firstly, his strikingly different literary technology of recording laboratory events and, secondly, his attempt to establish notebooks as a research technology in science. In 1827 Faraday had just published his “Chemical Manipulation, being Instructions to Students in Chemistry, on the Methods of Performing Experiments of Demonstration or of Research, with Accuracy and Success” which we might regard as one of the earliest student manuals in science which aims at teaching the art of experiment. There he states:

The Laboratory notebook, intended to receive the account of the results of experiments, should always be at hand, as should also pen and ink. All the results worthy of record should be entered at the time the experiments are made, whilst the things themselves are under the eye, and can be re-examined if doubt or difficulty arise. The practice of delaying to note until the end of a train of experiments or to the conclusion of the day, is a bad one, as it then becomes difficult accurately to remember that succession of events. There is a

¹ Max Planck Institute for the History of Science, Berlin

probability also that some important point which may suggest itself during writing, cannot be ascertained by reference to experiment, because of its occurrence to the mind at too late a period.²

Faraday described the notebook as the experimenter’s companion of the bench, a tool always at hand to immediately account for important laboratory events. His attempt to provide general rules for how to use this tool properly indicates that he wanted to transform the heterogeneous practices of memorising laboratory experiences into a trustworthy, efficient and communicable research technology. By using the term research technology I partly refer to the term “literary technology” which circumscribes the powerful establishment of writing techniques to communicate experimental practice to readers of early modern natural philosophy. Laboratory notebooks produced at the bench, however, are not used for communication in the first place but to memorise personal or collective experiences. The recording techniques, however, could and did vary according to the kind of research experimenters undertook and the particular forms of life of the experimenters.³ The distinction made here between technique and technology of tool use is important for our historical understanding of the practice of notebook writing and is strongly informed by the work of the French anthropologist Marcel Mauss. He defined technique as “traditional effective actions” and technology as a term designating a scientific discourse about “techniques.”⁴ Following this line of thought it is reasonable to regard Faraday’s “Chemical Manipulation” amongst other things as intending to spark off a disciplinary discourse about the proper techniques of recording laboratory events and to establish the practice of notebook keeping as a research technology in science.⁵ But in practice his book was not widely read nor did the author himself strictly follow the rules provided there.⁶ If we look for example at Faraday’s own notes we may conclude that many of his pages look like the diary of a Victorian gentleman, written at the conclusion of an exciting day (Figure 1).

The rich narrative about experimental procedures allows the reader to take part in a literary exploration of “new provinces of science.” However, the reflexive historian might wonder to what extent the literary coherence – having been constructed only retrospectively – correlates with the working order of the laboratory event.⁷ Furthermore instead of assuming notebook writing as a culturally shared and promoted practice, i.e., a research technology of early Victorian science, we are confronted with varying techniques of writing notebooks of which Faraday’s mode is only one kind. Joule’s numerical technique of keeping accounts of laboratory experiences is another one. It stands in stark contrast to Faraday’s practice and hasn’t been discussed in the literature as to its historical significance.

In the next section I therefore introduce the reader into the way Joule used his laboratory book by discussing some characteristic pages. The following section discusses approaches to and problems in making sense of Joule’s real time recordings of laboratory experiences. I then investigate which “traditional effective