

The Trinity 2.0 Arrangement of Sraffa Papers Section D3/12: Notes on *Production of Commodities by Means of Commodities*^{1, 2}

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1. Introductory

Beginning in September 2016 and with the endorsement of Piero Sraffa's current literary executor Lord Eatwell, the Wren Library, Trinity College, University of Cambridge, began releasing on the Janus portal of its website thousands of pages of color digital images contained in the most important files from the Sraffa Papers.³ This is a very welcome development as now all interested scholars and

¹ Usha Pradhan from University of Missouri Kansas City is credited with invaluable assistance in the development of the Trinity 2.0 arrangement. An earlier version of some material especially on the history of the Sraffa archive appears in the Introduction co-authored with Riccardo Bellofiore of the "Symposium on New Directions in Sraffa Scholarship" in the winter 2017 issue of the Emerald book series *Research in the History of Economic Thought and Methodology* (Bellofiore & Carter 2017b). The Trinity 2.0 arrangement of the Sraffa papers is given in links as links in Appendix 2 below for the material in the 1920s and can also be found at the present writer's *Digital Sraffa* website at www.sraffaarchive.org. This version is forthcoming in the online journal [American Review of Political Economy](#).

² This work is dedicated to the memory, integrity, and fighting spirit of Frederic S. Lee who in 2014 left our world much too soon. Fred lived long enough to know, and express gratitude for the fact, that in 2013 with a handheld digital camera I had made the first complete color digital copy of the material in D3/12, and ergo that the Sraffa Papers would in some way, shape, or form finally being made available as completely accessible digital images, although at that time it was not at all certain as to what that would look like. On the life, legacy, and professional and scholarly contributions of Fred Lee, interested readers can go to the page dedicated to him on the Heterodox Newsletter website ([link](#)).

³ The effort is directed by Giancarlo de Vivo and Murray Milgate; it is led by Jonathan Smith, Archivist and Modern Manuscript Cataloguer, and Hilary Moreton and James Kirwin, the latter three of the Wren Library, Trinity College, University of Cambridge. The main page can be found at the following [link](#). Note that the current project is independent of the Wren Library's uploading of the material, and that the moniker "Trinity 2.0" is not an indication of any formal connection therein. Rather the name was chosen because it best describes the endeavor of taking the arrangement of Sraffa's Papers to the next level, one commensurate with



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lay-people alike are able to enjoy deep unfettered study of the non-interpreted raw material from which to base their own ideas, opinions, and developments regarding Sraffa's very much unfinished intellectual project. With this development matters are quickly moving from famine to feast and likely in the coming months and years we will become inundated with material as images of Sraffa's handwritten notes start to populate the worldwide web. And as economics remains in search of its soul, we are fortunate indeed to now have the breadth to finally complement the depth of Sraffa's ideas and developments on matters of great interest and importance to the science.

Since the publication of *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory* (PCMC) in 1960, Sraffa has been interpreted in different and not always amicable or compatible ways. The power of the approach cut across the science: against the neoclassicals Sraffa showed that their sacrosanct notion of a quantity of capital was bogus; against the Marxists Sraffa showed that their sacrosanct labor theory of value risked being redundant. And ever since there has been acrimony and debate hitting Sraffa on all sides. Archival scholarship has not been immune to these debilitations. Literature that directly consulted and cited the material started to crop-up in the 1990s as Sraffa's archive became open for scholars to consult in 1993. But the logistics of the manner the material could be consulted and utilized in terms of quotation remained under the original literary executor very cumbersome and rigid, since imaging of the material was strictly forbidden and permission for quotation not always assured.⁴

Deleterious became intellectual jousting matches between rival scholars over archival quotations of material that could not be independently substantiated or verified by any party. The effect of this was to diminish Sraffa's overall importance to the science by regulating his framework to a relative splinter movement of 'Sraffians' within the overall tradition of heterodox economics. Here the basic *modus operandi* of archival scholarship devolved into an exercise whose intent was to ostensibly enlighten readers with pontifications of what Sraffa 'really meant', usually involving copious and at times erroneous transcriptions of out-of-context quotations of the archive, the authenticity of which could never be established with certainty. The restrictive objective conditions within which heretofore research was conducted directly contributed to a weakened state of archival scholarship and a diminished role of Sraffa in economic science and the history of economic thought.

But all that is now changing.⁵ The pages below should be viewed as forged in a spirit of complementarity and collegiality with the expectation that as Sraffa's archive becomes less furtive and

the material prepared for scholarly study. This is accomplished by building on the Wren Trinity archival architecture laid down by Smith in the early 1990s.

⁴ It is fair to say that permission was readily given, certainly the present writer was never prevented from quotation of the material. However, it was having to ask for permission in the first place that remained cumbersome, and in a general sense this, coupled with being forbidden to image the material when at the Wren, prevented archival scholarship from flourishing thereby regulating Sraffa's notes effectively as dark matter from which the published accounts were to draw. This contributed to the endeavor teetering on alchemy over free scientific inquiry which played a role in the diminished importance of Sraffa generally, especially as younger scholars tended to avoid the matter altogether or remained ignorant and/or uninterested entirely.

⁵ For a taste of new and fresh possibilities when it comes to the intellectual and archival legacy of Piero Sraffa, readers can consult the recently published "Symposium on New Direction in Sraffa Scholarship", co-

esoteric, and its overall structure and context made transparent, important developments already made in the literature can have much wider interest, and the theory will be much freer and richer in its development.

It is into this vortex that the present endeavor steps. The digital images uploaded on the Wren website reflect a complete digital reproduction of the material as one would find it sitting at the Reader's Table at the Wren. This means that Sraffa's archival material available online is in its raw unfettered and non-interpreted state, a welcome development indeed. Sraffa himself seemed to have recognized the importance of making his manuscripts accessible in their entirety free from interpretation, as the following quote by Sraffa taken from Professor Pasinetti's (2000) important Archival Excursus makes clear:

That possible introductions and notes to the publication of my MS should be limited to supply the factual elements necessary to the understanding of the said MS leaving aside as much as possible any comment or interpretations of ideas. As far as the work of scholars that were to have access to my MSS, I am against the incomplete quotation of unpublished MSS" (Piero Sraffa, Sraffa Papers H2/89/56).⁶

With the uploading of the digital images on the Wren website in their raw form, Sraffa's wishes are being honored and respected. However, there is a downside to this too in that the material as it appears is vastly disorganized in terms of its structure, conceptual clarity, and analytical cogency. It is to the provision of this much-needed clarity and cogency that the pages below are directed. This takes the form of the Trinity 2.0 arrangement of Sraffa's archival material, primarily an online endeavor that, beginning with the "mass of old notes"⁷ used in preparation of PCMC (archived at D3/12), organically interfaces the different conventions that have heretofore been applied to the material. This develops a complementary co-convention which renders Sraffa's archival material better prepared for scientific study.

Deep study of the archive requires that not only the individual pages written be studied, but also that the overall structure and content of the material be understood and contextualized. This is especially important for a scholar whose archival legacy is as rich and whose theoretical foundations as robust as Sraffa's. The Trinity 2.0 arrangement attempts to provide this much needed structure and context by viewing the entirety of the material as a complete organic text and organizing upon this foundation.

edited by Riccardo Bellofiore & Scott Carter (2017a) in *Research in the History of Economic Thought and Methodology*.

⁶ The original Italian translated by Professor Pasinetti is as follows:

"Che le eventuali introduzioni e note alla pubblicazione di miei MS dovrebbero essere limitate a fornire gli elementi di fatto necessari alla comprensione dei MS stessi lasciando da parte il più possibile commenti e interpretazioni di idee. Per quanto riguarda lavoro di studiosi che avessero accesso ai miei MSS sono contrario alla citazione incompleta di MSS inediti" (Piero Sraffa, Sraffa Papers H2/89: 56).

⁷ Sraffa references his notes in the Preface to PCMC while explaining the long length of time of its gestation: "Whilst the central propositions had taken shape in the late 1920's, particular points...were worked out in the 'thirties and early 'forties. The period since 1955, while these pages were being put together out of a mass of old notes, little was added, apart from filling gaps which had become apparent in the process" (Sraffa 1960, p. vi).

To date, Trinity 2.0 has been developed for the first 102 of the 115 files in Wren Trinity Sections D3/12 Sraffa's Notes on PCMC, as well as Section D2/4 which contain Sraffa's Lecture Notes on the Advanced Theory of Value given in 1928-31.

This essay is organized as follows. In Section 2 the history of the archive is discussed (note an earlier version some of this material appears in Bellofiore & Carter 2017b). Section 3 discusses the interface between the two previous conventions of the archive, the Wren Trinity catalogue (WT) and Bharadwaj-Garegnani inventory (BG). Section 4 introduces readers to the Trinity 2.0 (T2) arrangement where it is shown to be the result of an organic and informed interface between WT and BG, with Sraffa's own pagination schema also playing a very important organizing role. Section 5 concludes. Provided as Appendices are (i) a table for the material in D3/12 and (ii) links to the Google Docs slideshows of the material from the 1920's (D3/12/1 through D3/12/13 and D2/4) with live hyperlinks to the material for both the T2 arrangement and the WT catalogue.

2. History of the Arrangement of the Sraffa Papers

Jonathan Smith, Trinity Archivist who supervised the Wren Trinity catalogue of Sraffa's Papers, indicates in a very instructive footnote that "the history of attempts to catalogue Sraffa's papers is not particularly straightforward" (Smith, 2012, p. 1297, note *). What we do know is that in 1974 Alessandro Roncaglia and John Eatwell provided a preliminary list of the material. Smith reports this was done in relation to the two scholars' translation of Sraffa's original 1925 Italian article critiquing Marshallian theory (Sraffa 1925), this article being the precursor to the truncated 1926 version that appeared in English in the *Economic Journal* (Sraffa 1926). For purposes of this translation, Roncaglia and Eatwell had asked Sraffa permission to consult the preparatory material for the 1925 and 1926 articles and while engaged in that endeavor realized how important it was to make an inventory of the content of the entire bulk of material.⁸ Smith reports that they wrote to Sraffa on 8 August 1974 and that Sraffa returned the correspondence one month later. Roncaglia and Eatwell then sent a letter in January 1975 and Sraffa responded several months later in June, and during the interim in March 1975 we find papers catalogued by Roncaglia. Smith articulates three points related to the Roncaglia-Eatwell inventory and exchange with Sraffa:

"First, that the catalogue of papers that date from this period (e.g. 1974-75) are more a locations guide than a catalogue – sort of a preliminary draft that you would expect to be made before any attempt was made to order the papers. Second, that in their second letter Eatwell and Roncaglia make it evident that any ordering of the papers was yet to take place. Third,

⁸ In an email exchange to the present writer in 2015, Professor Roncaglia related his account of this as follows:

[W]hat I did in 1974-1975, with some help from John [Eatwell], was not a catalogue or an inventory, but simply a rough list of material in Sraffa's Trinity room, mainly with the aim of helping him to find things around and with the benefit, on my side, to talk with him on his manuscripts. Most of my time in Cambridge in that period (in all, a few weeks) was spent in preparing together with John (and discussing with Sraffa) an English translation of Sraffa's 1925 article (Roncaglia to Carter, December 9, 2015; reproduced with permission).

that Sraffa forbade any further cataloguing at that time” (Smith, 2012, pg. 1297, note *; emphasis added)

The second and third points especially are of tremendous importance. Here evidence emerges that the ‘original order’ in which we find Sraffa’s papers has to be taken with a relative grain of salt. In the first instance many-a-hand was placed on the material even before Sraffa’s death, as reported by Smith (2012) echoing a warning originally given by de Vivo (2001):

“De Vivo (2001)...sounds a warning with regard to the archive as a whole and reminds us that Alessandro Roncaglia, John Eatwell, Antonietta Campus and Pierangelo Garegnani all helped with his papers during his lifetime, and we should thus be cautious in coming to any conclusions based on the arrangement of the material” (Smith 2012, p. 1296).

And Smith reports that Sraffa himself indicated that as of 1975 the order of the papers was yet to be determined, as seen in his (Sraffa’s) reply dated June 1975 to the Roncaglia and Eatwell correspondence sent the previous January:

“In his reply [Sraffa] explains that he feels that the questions raised are connected with the final destination of the papers and that any work on them should cease until he had made up his mind about their final place of deposit” (Smith 1012, p. 1297, note *).

Sraffa never made up his mind, and we can be reasonably certain that the papers in the order we find them in the archive reflects the state at which Sraffa indicated in June 1975 – that is to say, the “final place of deposit” remaining undetermined. This sentiment is a very important and very much overlooked. In understanding the particulars of any arrangements of Sraffa’s papers whether it be BG, Wren Trinity, or the organic T2 convention introduced below, what must be admitted by all parties is that none of them correspond to how Sraffa himself eventually envisioned the “final destination” of the material.

Sraffa died in September 1983, and in his will appointed Pierangelo Garegnani as his Literary Executor, who with Krishna Bharadwaj began in that autumn of that year an account of Sraffa’s archival material. In an article first published in Italian in 1998⁹, Professor Garegnani (2003) recounts the story in the following way:

“In autumn of 1983, shortly after Sraffa’s death, and then in Spring 1984, Professor Krishna Bharadwaj of Nehru University, New Delhi and myself made a first reconnaissance and inventory of the manuscript material, not least to ensure nothing got mislaid when it was moved from Sraffa’s rooms in Trinity or in the Marshall-Library to a store-room of the College. In fact, only an index of the manuscripts a few pages long existed before then, drawn up by Professor Roncaglia, when helping Sraffa tidy up his papers in around 1974.

The inventory thus carried out immediately after Sraffa’s death was followed by a more detailed examination and systematic listing of the manuscripts as a preliminary to working on them (Trinity College, the owner of the papers, postponed a professional cataloguing of the papers; cataloguing was begun only after the papers were made available to the public, in early

⁹ ‘Sui manoscritti di Piero Sraffa’, *Rivista Italiana degli Economisti* (*Journal of the Società Italiana degli Economisti*), April 1998.

1994). The systematic examination and listing of the manuscripts was rather laborious because of their, for the most part, extremely fragmentary nature; for example, all the pages in the enormous mass of material had to be numbered. It was on this basis that the papers were microfilmed at the University Library in 1987. This job took up almost all the time that Professor Bharadwaj and I could devote to the manuscripts up to the summer of 1987” (Garegnani, 2003, p. 623)

Here we find that the original Bharadwaj-Garegnani (BG) inventory underwent two stages. The first is the preliminary inventory accomplished immediately after Sraffa’s death ostensibly following the Roncaglia-Eatwell (RE) list from a decade earlier, and second “a more detailed examination and systematic listing of the manuscripts as a preliminary to working on them”. It is in the first preliminary inventory of 1983-84 that we conjecture the meta-structure of files in the BG inventory was set, following the same method as the RE list as in both RE and BG the different collections of files were identified according to the location they were found in Sraffa’s various quarters. We know this is the case for RE given Smith’s identification of it more as a “locations guide”, something made explicit in a letter to Sraffa from Roncaglia and Eatwell dated 8 August 1974:

“[W]e have already helped you to conduct a number of searches in your rooms and now we have a good idea of what papers there are, where they are, and what papers are, at the moment, missing. We have so far compiled two lists of materials, one relating to the cupboard left of the entrance door, the other the brown paper packet at present in your room at the Marshall Library” (Roncaglia and Eatwell to Sraffa, quoted in Smith 2012, pg. 1297, note*).

Both Kurz (2009) and Smith (1998) report that the same “locations method” was used in the meta-file convention adopted in BG:

“After [Sraffa’s] death the late Krishna Bharadwaj and Pierangelo Garegnani produced a valuable inventory and numbering of the papers so that nothing should get lost in moving them from Sraffa’s room in College to the place of storage. The inventory was based on the locations where the papers had been found in Sraffa’s rooms and the groupings he had given them. Bharadwaj and Garegnani also began to examine the manuscripts. Jonathan Smith, archivist, then produced the catalogue of the papers on behalf of Trinity College, which is the one now generally used” (Kurz 2009, p. 266).

For his part Jonathan Smith characterizes the BG inventory as follows:

“In a codicil to his will, Sraffa named Pierangelo Garegnani as his literary executor and it was to Garegnani that the task was left to bring together the physical remains of Sraffa’s literary estate. Much important material was in Sraffa’s room in Neville’s Court, the second court of Trinity College, in bookcases, chests of drawers and suitcases.... Although some papers were in good order, others were something of a jumble. Further material...was in the rooms that he had used as Librarian of the Marshall Library of Economics. In the early months of 1984, Garegnani and Krishna Bharadwaj prepared a rough inventory of the papers as they found them in two locations, before they were boxed and removed to library storage. From May 1985 to June 1986 Professor Bharadwaj worked on the papers under the supervision of

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Garegnani. In this time, she was able to work her way through the papers, item by item, identifying and assessing the significance of each piece.

A more detailed catalogue was prepared, and items were individually numbered and prepared for microfilming, which was undertaken by the Photography Department of Cambridge University Library. Although the Bharadwaj list is fundamentally flawed in archival terms, this intermediate catalogue is most important in helping to preserve the order of the papers as Sraffa left them (it is clear that Garegnani and Bharadwaj knew the importance of this). There is a map of the locations of papers as they were found in Sraffa's rooms, and what initially seems to be clumsy references to "Green Chest, Bottom Drawer" or "Horizontal piling" give useful clues to the arrangement of the papers while in use" (Smith 1998, p. 44).¹⁰

Clearly the accounts of Garegnani, Kurz and Smith resonate. In each we find the BG inventory broken into two distinct phases; an initial inventory based on the Roncaglia-Eatwell "locations guide" of the various piles in Sraffa's rooms, and a later more developed inventory of the material, one that as we will discover also took conceptual content of the material into account. The end of the BG endeavor can be marked as 1989, after which Bharadwaj began to experience health problems, which as Garegnani¹¹ informs us, interfered with her continued work on the papers, precipitating her premature death in 1992 at the young age of 57.¹² Around the time of Mrs. Bharadwaj's death in the early 1990s the Wren Trinity convention was completed, and in 1993 the archive finally opened for scholarly study for those with the means and/or wherewithal to travel to Cambridge and visit the Wren.

¹⁰ A typed manuscript outline of the BG inventory is archived as J14, the images of which can be found [here](#).

¹¹ "After 1987...deterioration in Professor Bharadwaj's health hindered her work increasingly until her premature death in 1992, shortly before she had planned a visit to Italy, so we could resume work on the Sraffa manuscripts" (Garegnani 2003, p. 624).

¹² Geoff Harcourt's (1993-4) Memoir of Mrs. Bharadwaj in the *JPKE* recounts the trying time she had while engaged in this endeavor:

"The last time I saw Krishna for any length of time was when she came to Trinity in the middle and late 1980s to put some order into Piero Sraffa's papers; Piero had died in September 1983 and Pierangelo Garegnani, his literary executor, asked Krishna to help with this mammoth but vital task. It was a time of great tension for Krishna for her love of Sraffa himself and her belief in the importance of his contributions obliged her, she thought, to take on this daunting task; yet she also felt keenly the sacrifice of time she would otherwise have spent working in India on pressing Indian problems. This created an insoluble dilemma for her, a sense of ambivalence and doubt as to whether she had done the right thing, made the correct choice, and I fear that the psychological trauma all this undoubtedly caused her was a significant factor leading to her final illness. Certainly, I had never before seen her so agitated and unhappy, working--effectively as ever and as long hours as ever, but without the usual resilience and *joie de vivre* that went with her sense of purpose and drive. It was desperately worrisome for her friends to see her health deteriorating under the strain; we could offer support but not really relieve her of the essential burden and pressure. I was glad to learn the other day (January 1993) that the papers are in order and catalogued, although not yet opened, for this is another vindication of Krishna's devotion and work-but at what a cost." (Harcourt 1993-4, pp. 308).

3. The Bharadwaj-Garegnani Inventory and the Wren Trinity Catalogue

The Wren Trinity catalogue developed by Smith constitutes the presentation of the archive to the public, including the presentation of the digital images on the Wren Library website. It is therefore crucial to understand the architecture of the convention to make sense of the material. In its totality, Wren Trinity accords to the following conceptual structure of macro-sections:

Table 1: Macro-Section of the Wren Trinity Convention (links go directly to Janus portal of Wren Library)

- A. [Personal and Family Papers](#)
- B. [Academic Career](#)
- C. [Correspondence](#)
- D. [Notes, Lectures, and Publications](#)
- E. [Diaries](#)
- F. [Memoirs of colleagues](#)
- G. [Publications by others](#)
- H. [Bibliographical and manuscript interests](#)
- I. [Items removed from printed books](#)
- J. [Miscellaneous](#)

The amount of material in the various sections is often quite voluminous as it is interesting. Most of the recent literature on Sraffa's archive consults D. Notes, Lectures, and Publications, and to a lesser extent C. Correspondence, E. Diaries, and I. Items removed from printed books. Section D is the most complex and itself divides into three subsections, D1. Notes, D2. Lectures, and D3. Publications. A partial breakdown of this section is in the Table 2:

Table 2: Breakdown of Section D of the Trinity Convention of the Sraffa Archive (links go directly to Janus portal of Wren Library)

[D1: Notes \(1923-63\) \(92 sub-groupings\)](#)

[D1/1](#)

...

[D1/91](#): Black Notebook (1943)

[D1/92](#)

[D2: Lectures \(1927-43\) \(8 sub-groupings\)](#)

[D2/1](#): Lecture notes on economic theory (n.d)

[D2/2](#): "The corporative state", given to "Keynes Club" (1927)

[D2/3](#): "Revalorization of the lira", given to Emmanuel Economic Society (1927)

[D2/4](#): Lecture Notes on the Advanced Theory of Value (1928-31)

[D2/5](#): Lectures on continental banking (1929)

[D2/6](#): "Il banchieri fiorentini nel 200" (14 May 1929)

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- [D2/7](#): Two lectures on Italian problems...(1941-43)
[D2/8](#): Lectures on Industry (1941-43)
[D3](#): [Publications \(1920-73\) \(14 sub-groupings\)](#)
[D3/1](#): L'Inflazione monetaria in Italia durante e dopo la Guerra (n.d)
[D3/2](#): "The Bank crisis in Italy", *Economic Journal (EJ)* (1922)
[D3/3](#): Untitled article on the economics of fascism (1923)
[D3/4](#): Obituary of Maffeo Pantaleoni (1924)
[D3/5](#): "Sulla Relazione fra costo e quantita prodotta" (1925)
[D3/6](#): The Laws of returns under competitive conditions, *EJ* (1926)
[D3/7](#): "Increasing returns and the representative firm: a symposium", *EJ* (1930)
[D3/8](#): "An alleged correction of Ricardo". *QJE* (1930)
[D3/9](#): "Dr Hayek on money and capital", *EJ* (1932)
[D3/10](#): "Money and capital: a rejoinder", *EJ* (1932)
[D3/11](#): *The Works and Correspondence of David Ricardo* (1930-1973)
[D3/12](#): *Production of commodities by means of commodities* (1927-67)
D3/12/1
...
D3/12/115
[D3/13](#): "*Production of commodities by means of commodities: A Comment*", *EJ* (1962-67)
[D3/14](#): "Produzione congiunta di merci a mezzo di merci. Riposta a Manara"
(14 May 1929)

[D3/12](#) Notes on *Production of Commodities* contains 115 file folders, the first 102 of which constitute the textual evidence for the Trinity 2.0 arrangement developed below.

The BG convention also has a meta-file designation schema, one that is ostensibly based on the "piles" of files as they were found in Sraffa's quarters. For the first 109 files in D3/12 we discern six distinct BG meta-file designations distinguished by capital letters A, D, C, D, E, and P for a total 109 files as seen in Table 3:

Table 3: BG "Pile" Documents in Wren Trinity D3/12

Pile A = 8 files	Pile D = 12 files
Pile B = 20 files	Pile E = 5 files
Pile C = 17 files	Pile P = 46 files

The different BG meta-file designations are not in chronological order, and the rhyme and/or reason behind their "pile" composition has not yet been adequately studied. It could very well be that Sraffa lumped these files together because of some conceptual resonance between them, although a quick inspection reveals that such is difficult to discern. Or else this could merely represent Sraffa's rather nonchalant and arbitrary depositing of files onto "piles". With the digital images now available for

unfettered study, interested scholars can explore such matters in discerning the rationale (if any) for the particular composition of the files according to the BG convention.¹³

No matter the reasons why the various files may have been placed in specific piles, what is clear is that Wren archivist Jonathan Smith rearranged the lot according to rough chronological and conceptual order, the latter being roughly based on the content organization of PCMC. The adjective “rough” indicates that not every file precedes exactly according to Sraffa’s intellectual and constructive as well as chronological timeline, which itself is a function of the fact that many files contain documents across several years. This latter point speaks to the zig-zag character of Sraffa’s complex archive.

In making sense of the material it is useful to approach the chronological meta-file ordering in WT according to the periodization of Sraffa’s own constructive intellectual activity (see also Appendix 1 below for a succinct presentation of this tripart periodization of the 115 files that comprise D3/12):

1. Period 1 - 1927-1932: D3/12/1, D3/12/3-13
The first period begins after Sraffa arrives in Cambridge after having published his 1925 and 1926 articles. There are 13 files in this portion of the archive for a total of around 1005 image-pages.
2. Period 2 - 1940, 1942-1946: D3/12/2, D3/12/14-44
The second period begins in 1940 with Sraffa’s internment on the Isle of Man and then with vigor in 1942 through 1946. There are 33 files in this portion of the archive for a total of around 2005 image-pages.
3. Period 3 - January 1955-1960: D3/12/45-61, D3/12/64-110, D3/12/112, D3/12/114
The third period begins in January 1955 and continues through 1960 with the publication of PCMC. There are 66 files for a total of around 3990 image-pages.
4. There are at least four files that belong to the period after 1960: portions of D/12/42 and most D3/12/111, D3/12/113, and D3/12/115.

This chronological meta-structure of the Wren Trinity catalogue follows the general conceptual structure in the development of Sraffa’s constructive project. Figure 1 below gives a visual concordance mapping between the file different BG and Wren Trinity meta-file distinctions for the first 108 files in D3/12 according to the following color scheme:

- Period 1 (1920’s) = blue
- Period 2 (1940’s) = green
- Period 3 (1950’s) = gold
- Post-1960 = red; this latter is limited to D3/12/42 as the mapping below shows the first 108 files thus excluding the three other files (D3/12/111, D3/12/113, /115) from the post-1960 period.

¹³ It will be of great interest to see whether in his own archival material, Professor Garegnani left any account of the inventory with Mrs. Bharadwaj; it should be noted that there is no account of the matter in Mrs. Bharadwaj’s archival material, as reported in personal exchange with Cristina Marcuzzo.

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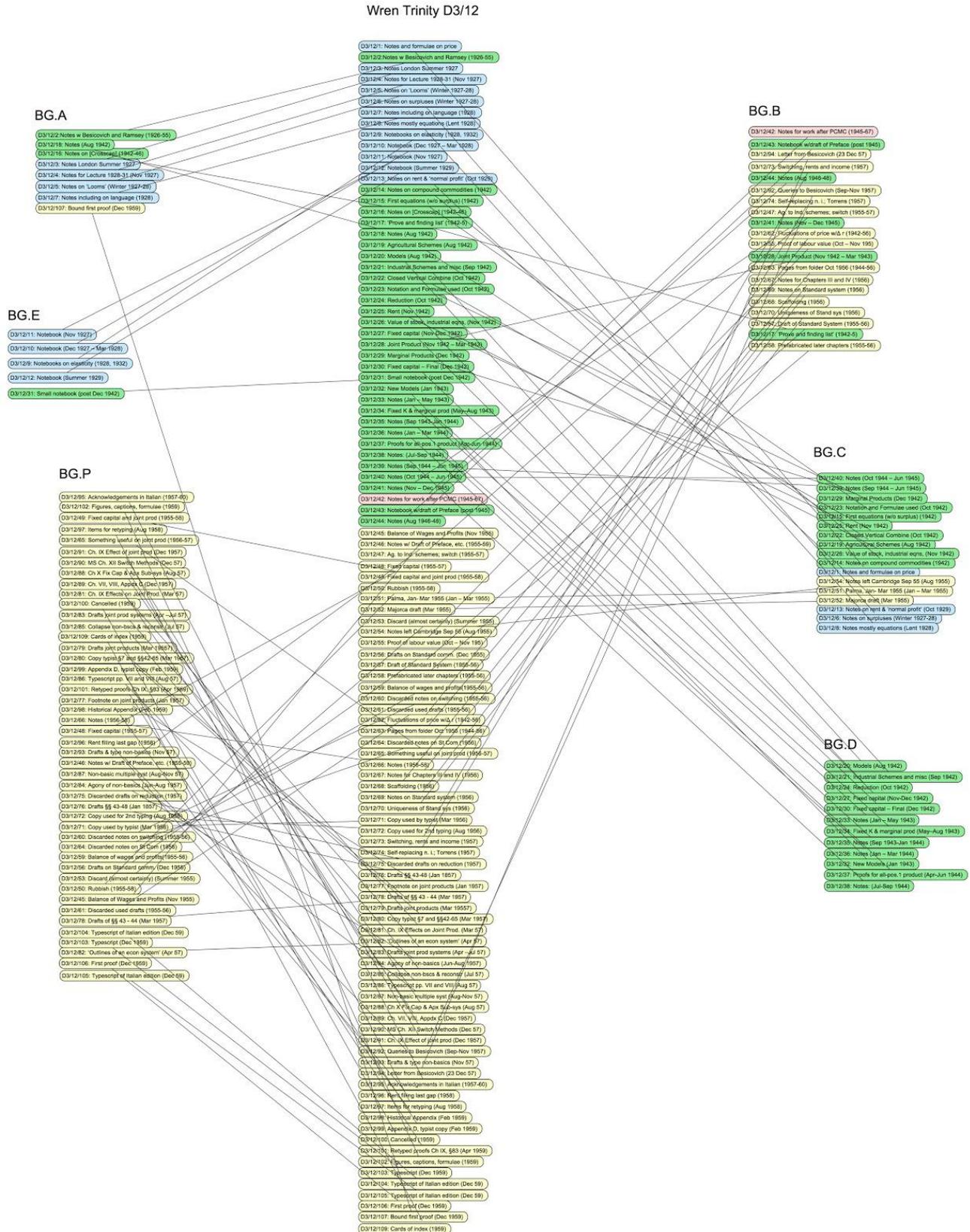


Figure 1: Concordance Mapping of BG to Wren Trinity for first 108 files of D3/12

4. The Trinity 2.0 Arrangement

From Figure 1 and Appendix 1 the amount of material in D3/12 can be discerned as quite large, amounting to well over 5000 mostly handwritten pages. Understanding the fascinating process whereby these thousands of pages were winnowed down into a monograph on the pure theory of value and distribution of less than 100 pages in the form of PCMC requires an account of the material in terms of its structure, context, and content. Such a rendering allows for the interested reader to make an account of the development of the analytical framework that Sraffa included in his book, and also the parts he left out. This all underscores the fact that Sraffa's book itself was only a Prelude, which makes interpretation of the material an open canvass theoretically indeed. All this requires that the material be prepared for the rigors of such open study, which is precisely the purpose of the Trinity 2.0 arrangement.

The Trinity 2.0 arrangement (T2) melds two distinct accounts of the same material, the Wren Trinity catalogue (WT) and the Bharadwaj-Garegnani inventory (BG), along with (when fortunate enough to have) Sraffa's own pagination scheme (SP). The result is an organic interface that allows interested readers an opportunity to gain a sense of structure and intellectual-bearing vis-à-vis the voluminous and chaotically-extant material, thereby providing scientific cogency to facilitate its proper study. In the main the BG inventory serves as the foundation for T2's inner-file disposition of the material as a collection of note-sets, and to Mrs. Bharadwaj and Professor Garegnani a great debt of gratitude is owed. As T2's primary goal is towards rendering conceptual and analytical cogency, the role of Sraffa's pagination looms large and indeed trumps all others. This becomes important for those files containing jumbled content (a feature of WT and to a lesser extent BG) which are reconstructed in T2 according to Sraffa's pagination; note all of this is meticulously accounted for in the overall Trinity 2.0 project.

Consider the different ways in which WT and BG approach the archive. In terms of the meta-file, WT organizes the material in more-or-less chronological and conceptual order, the latter following the chapters in Sraffa's book. It uses the alpha-numeric archival designation D3/12 followed by the file number; e.g. D3/12/1, D3/12/2,..., D3/12/115. BG by contrast has a meta-file convention ostensibly based on the various "piles" of files that were found in Sraffa's quarters upon his death, the order of which is chaotic and adheres to no obvious logic. In BG capital letters are followed by a numeration scheme, sometimes Arabic numbers (A.1, A.2, etc.) and sometimes capital Roman numerals (B.XIII, BXIV, etc.).

The BG inventory makes an informed account of the material contained in the files conceived as stand-alone interconnected note-sets, or documents of various page length. This stands in contrast to WT which in terms of the inner-file does not attempt any conceptual organization or intentional arrangement. Note-sets are sometimes identified in WT but only accidentally when the convention "piggy-backs" on Sraffa's own pagination. Such "piggy-backing" made a grueling task less taxing by allowing the archivist staff to pencil-in the catalogue of the document on the first page and skip over the many pages that followed in the note set.¹⁴

¹⁴ See for example the fifth of eighteen documents in the file D3/12/4. This eight-page long document is arranged in T2 as [5-18.8](#) (prefixed by D3.12.4.). Inspection of the images shows that only the first page has the WT convention penciled in the top right corner, the remaining seven pages bearing that convention as understood; in terms of the WT convention these pages would be cited as 5.1, 5.2,...,5.8 (all pre-fixed by

The level of the inner-file is where the BG convention shines, and we are very fortunate to have the two most capable minds – Mrs. Bharadwaj and Professor Garegnani - rendering this conceptually cogent preliminary account of the material. In terms of content, in BG each file is broken down into a collection of documents which are given an Arabic number or capital Roman numeral. These documents are of varying page length; some single-paged and others up to tens of pages long. BG pagination accords to lower case Roman numerals. As an example, consider the file “Notes London, Summer 1927” which is the subject of Garegnani’s (2005) “turning point” thesis.¹⁵

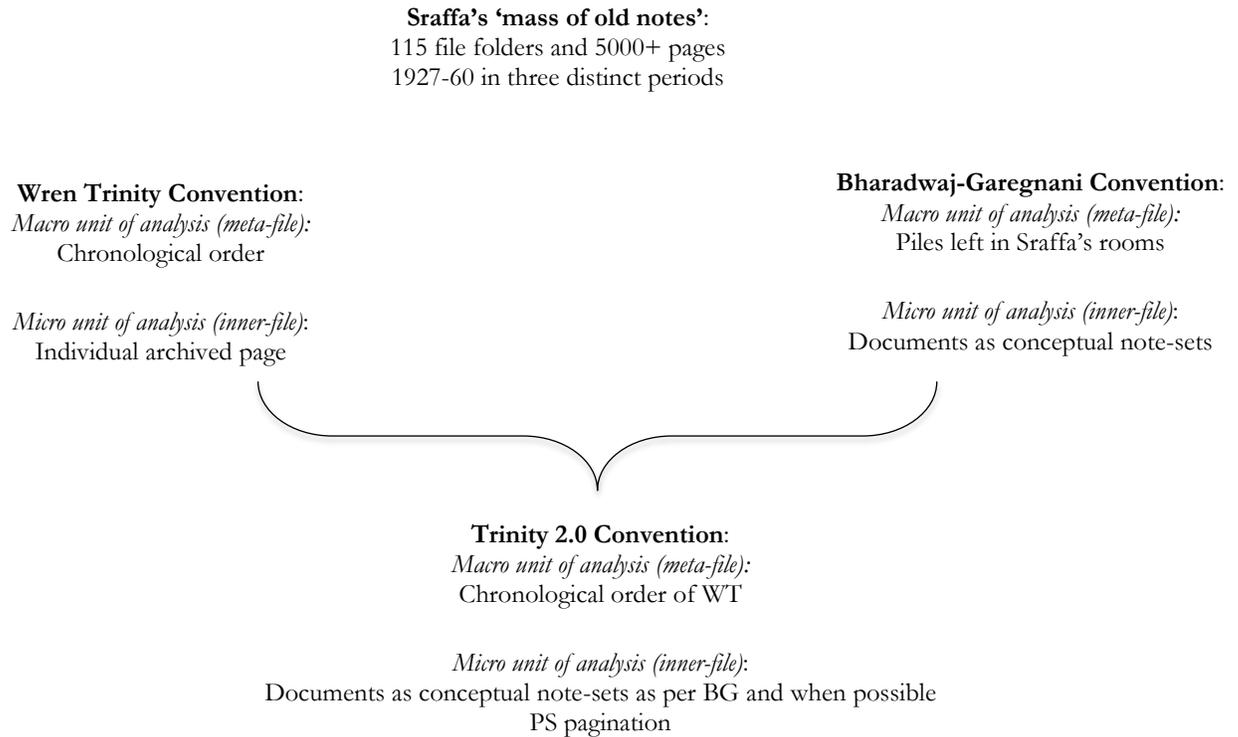
The file Garegnani studies is archived according to WT as D3/12/3 and BG as A4. It consists of 72 image-pages broken down into 28 documents according to the BG convention. The majority of these 28 documents are single-page notes, but as Garegnani (2005) informs us, the heart of the file contains three important documents, each many pages long which Sraffa’s titles himself. These are archived according to the BG convention as:

- [A4.4i-xxi](#) General Scheme (21 pages)
- [A4.16i-vii](#) Physical Real Cost (7 pages)
- [A4.21i-xb](#) Distinction between two T.V. (11 pages)

The BG convention allows for discernment of the material within each file as a collection of note-sets/documents of varying page length. WT by contrast makes no attempt to conceptually distinguish the inner-file content, and its pagination schema is directed at making an account or catalogue of the material not guided by logical or conceptual order. Here we see that the different arrangements approach the material in very different ways, with meta-file order the hallmark of WT and inner-file order the hallmark of BG. Trinity 2.0 melds these together, including Sraffa’s pagination when possible, as seen in the diagram in Figure 2 below.

D3/12/4:). Such piggy-backing on Sraffa’s pagination closely resembles the T2 designation which for the above would be 5-18.1-8, 5-18.2-8, ..., 5-18.8-8 (all prefixed by D3.12.4.; “dots” over “slashes” distinguishes T2). There are many other such instances of “piggy-backing” of WT on Sraffa’s pagination, however it is not consistently applied throughout the WT catalogue.

¹⁵ Professor Garegnani (2005) argues that November 1927 marked the “turning point” in Sraffa’s thinking away from a critique of Marshall and marginalist theory generally and towards a rehabilitation of Classical political economy. Although an interesting subject and one that carries with it an equally interesting discussion and debate in the literature, the importance of Garegnani’s article for our present purposes concerns the hybrid convention he constructs and uses that serves as the prototype for T2; accordingly we do not consider here the intellectual debates surrounding archival scholarship. Readers are referred to the section “A Sketch of the Debate on the Path from the Archival Notes to PCMC” that appears in Bellofiore & Carter (2017b) for a brief and well-written synopsis by Bellofiore on the state of the Sraffa archive debate, including references to some of the seminal literature across perspectives.

Figure 2: Sraffa's "mass of old notes" and the different archival conventions

Pierangelo Garegnani's (2005) initial hybrid BG-Trinity interface

It is Professor Garegnani himself who paves the way for the development of the hybrid interface between the two conventions. In the above referenced 2005 article, using his knowledge of the BG arrangement he develops and utilizes a prototypical hybrid of the WT-BG interface for citation of the documents in expositing and analyzing the constructive content of the file:

[The material in question is] D3/12/3 in the Trinity catalogue, and [archived alternatively] from A4.4 to A4.28 in the Bharadwaj-Garegnani inventory. The document may at first appear to show discontinuities, but apart from the unity attributed to it by Sraffa's binding it together, a close study shows a substantial continuity between the three longest manuscripts constituting it, classified in the inventory as A4.4; A4.16; A4.21, separated by pages consisting almost entirely of bibliographies and reading notes that can be associated with the main texts immediately preceding them. (I note here that the catalogue drawn up by Trinity College Library often proceeds by groups of manuscripts and, as far as is accessible to me at present from Italy, does not separate the numerous manuscripts distinguished in the inventory. As a result, the page numbering will here refer to the latter, drawn up by Krishna Bharadwaj and the present author immediately after Piero Sraffa's death (Garegnani, 1998: 151). In the following, I will therefore give references to both classifications, with that of the Trinity catalogue first, followed by that of the inventory, which scholars consulting the manuscripts will normally find indicated in pencil on each manuscript page (Garegnani, 2005, p. 468, note 1; emphasis added).

Garegnani conceives the file as a collection of separate but related note-sets and isolates the above 3 note-sets as the constructive content in the file. This leaves the remaining ancillary documents as pages consisting almost entirely of bibliographies and reading notes that can be associated with the main text immediately surrounding them.

Notice how Garegnani attempts to combine the Trinity convention with the BG convention by “giv[ing] reference to both classifications, with that of the Trinity catalogue first, followed by that of the [BG] inventory”. He clarifies the matter in a subsequent footnote:

“Ibid. D3/12/3:A4.4.iv, and ii, respectively. From now on our reference to the prelectures will be abbreviated to the Arabic numeral of the manuscript, following A.4 and to the small roman numeral of the page (in the present case 4.iv and 4.ii, omitting, that is, the expression D3/12/3.A4 common to all pre-lectures references)” (Garegnani 2005, p. 468, note 6; emphasis added)

Here Professor Garegnani combines the Trinity “macro-file” designation (D3/12/3) with the BG “micro-note-set” designation (A4) as seen by his use of the hybrid designation “D3/12/3.A4”. This hybrid prototype based on the Trinity-BG interface is precisely that which underlies the method behind the T2 arrangement. In other words, the T2 preparation currently endeavored is of the same character and spirit as Garegnani’s own development of the prototypical hybrid Trinity-BG designation in his 2005 “turning point” article. This is taken as evidence that the path tread in the T2 preparation is correct and indeed the way to move forward.

Details of Trinity 2.0

Trinity 2.0 is an arrangement of the digital material. It combines the meta-file ordering of WT with inner-file arrangement of the material from mostly BG but also Sraffa’s own pagination which reigns above all; indeed there are several files jumbled in both WT and BG requiring a more thorough reordering of the material.¹⁶ This speaks to T2 being more than a mere concordance between WT and BG, as conceptual and analytical cogency and structure is its goal. Important for this is the arrangement of the material in terms of the relative ordering of the documents in the file (the specific document number in relation to the total documents in the file) and the relative ordering of the pages in the document (the specific page in relation to the total pages in the document). The schema of T2 allows for the gleaning of important information simply from the convention itself by allowing informed readers and scholars to know immediately where any particular document and/or image-page falls in the vast archive. This stands in marked contrast to the hieroglyphic and arbitrary character of the alpha-numeric conventions for both WT and BG.

The basic convention for Trinity 2.0 of D3/12 adheres to the following:

$$D3.12.\phi_x.(\delta_i - \delta_\Sigma).(\pi_j - \pi_\Sigma)$$

Where:

ϕ_x = File x in Trinity 1.0 (D3/12/ x ; $\Sigma_x=115$)

$(\delta_i - \delta_\Sigma)$ = Document i out of total documents in file

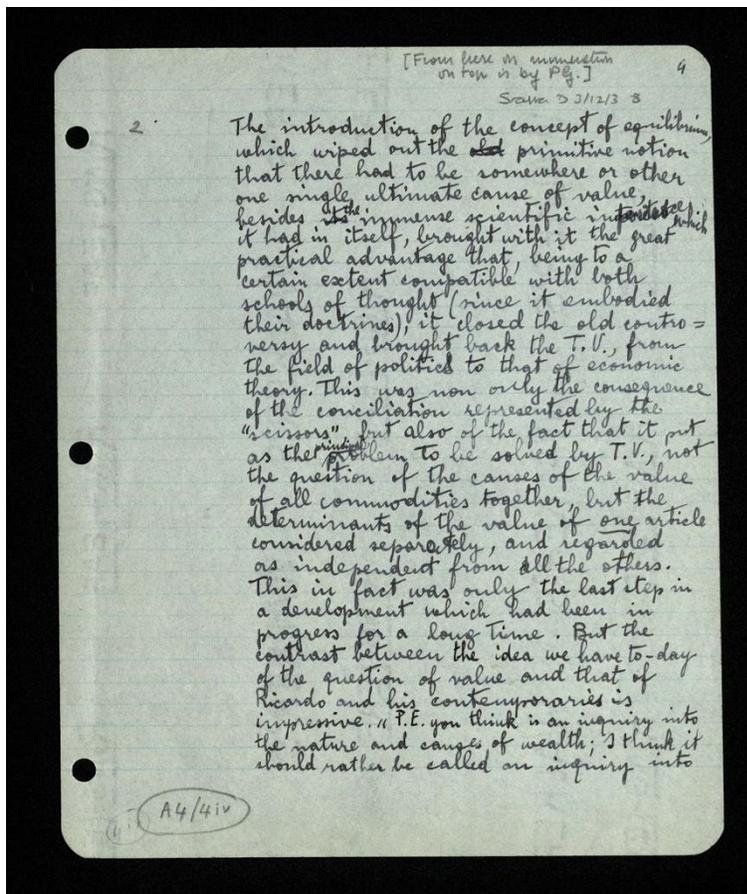
$(\pi_j - \pi_\Sigma)$ = Image-page j out of total image-pages in document

¹⁶ All such re-orderings are meticulously accounted for in Trinity 2.0.

T2 uses “dots” (.) rather than the “slashes” (/) of WT in distinguishing the different components of the convention. The first part of the convention “D3.12.ϕ_x” indicates the file-folder according to the Wren Trinity meta-file catalogue. The second part of the convention “(δ_i - δ_Σ). (π_j - π_Σ)” is developed in the spirit of the BG inner-file document and pagination schema. For T2 this document and pagination schema is relative in character and hyphens are used to distinguish the individual document and/or page with its respective total. It is this latter aspect of the convention that allows for the immediate contextualization within the file.

Take as an illustration the example above cited by Garegnani (2005) in his footnote; in his hybrid prototype this is referenced as D3/12/3:A4.4iv; the image of this archive is given below:

Image 1: Archive document referenced in Garegnani (2005), p. 468, note 6¹⁷



¹⁷ Inspection of the image shows at the top that Professor Garegnani writes in pencil “[From here on numeration on top by P.G.]”, and that the far-right upper corner has the number “4” written as we discern in Garegnani’s hand. This remains consistent throughout this file – i.e. for this file Garegnani numerated it separately from and in addition to the BG convention. This occurs throughout the file yielding a total of 71 Garegnani-paginated pages. This however is an anomaly for this file only; no other file within all D3/12 bears a separate consistent pagination by Professor Garegnani.

In general the WT convention appears (exclusively in pencil) in the upper right-hand corner; upon inspection for this image-page clearly discerned is “Sraffa D3/12/3:8” (although the colon between the “3” and “8” is understood). The BG convention by contrast generally appears in the lower right-hand corner and is usually circled; for this image-page clearly discerned is “A4/4iv”. In his 2005 article Professor Garegnani simply puts these two together as “D3/12/3:A4.Aiv”, where the colon (:) is the separator of the different conventions.

The Trinity 2.0 arrangement adopts Professor Garegnani’s basic convention and takes it up a notch; for this image-page the T2 convention is 4-28.4-21 (prefixed by D3.12.3). Here the WT file designation is retained with “dots” rather than “slashes” as D3.12.3, and the BG document and page designation is given its relative structure as 4-28.4-21. Read aloud, the Trinity 2.0 arrangement of this image page would be “the 4th page of a 21-page document, the latter being the 4th document of 28 total documents in the file D3/12/3”. As scholars become more familiar with the archive, the relative document and pagination structure of the T2 convention will come to make more sense: scholars will know that D3/12/3 are Sraffa’s Notes London 1927; they will come to know that within this file there are 28 total stand-alone documents, the three important being the 4th (4-28), the 16th (16-28), and the 21st (21-28); and they will be able to precisely locate a particular image-page document within the context of the total, in the example cited it is the 4th of 21 pages. Table 4 below shows the various conventions of the archive in question:

Table 4: Different conventions for individual archive page cited in Garegnani (2005)

Wren Trinity	Bharadwaj-Garegnani	Garegnani (2005) prototype	Trinity 2.0
D3/12/3/8	A4.4iv	D3/12/3:A4.4iv	D3.12.3.4-28.4-21

The “image-page” serves as the basic building block of the T2 convention. The T2 image-page is distinguished from the pages in WT and BG primarily regarding the backs of documents that contain content. For WT the backs of documents are not labelled. This is a function of the fact that WT was primarily designed for scholars to view the original material while at the Reader’s Table at the Wren, where identification of document backs is not necessary. WT document backs are designated by the letter “v” standing for “verso”. As an illustration consider the last page of the 21st document in D3/12/3 which has an archived back containing content. In WT this document is archived as D/12/3/69 and the back as D/12/3/69v.¹⁸

BG by contrast does identify document backs and labels such “b” for “back”. For BG this selfsame page is archive is A4.21x and the back A4.21xb. Clearly the BG convention was constructed to facilitate imaging, which is precisely what happened with the black and white microfilm copy of the entire archive taken in 1987 prior to WT.

Trinity 2.0 avoids altogether problems associated with document backs by adopting a continuous and consistent pagination schema. Hence the “front” of a document is given the same archival credence as the “back”, and it is here that the notion of the image-page comes in, as in this case one “actual” page will in fact be two “image-pages”. For Trinity 2.0 the documents are archived (with the prefix

¹⁸ The online images at the Wren website distinguish both front (“r” for “recto”) and back (“v” for “verso”).

D3.12.3.) as 21-28.10-11 and 21-28.11-11. The different conventions of this front-and-back document are given in Table 5 below:

**Table 5: Different conventions for front and back:
Example of final page of 21st document in D/12/3**

Wren Trinity	Bharadwaj-Garegnani	Trinity 2.0 (D3.12.3...)
D3/12/3/69	A4.21x	21-28.10-11
D3/12/3/69v	A4.21xb	21-28-11-11

Tables 6 and 7 below show the Trinity 2.0 arrangement for the entire content of file D/12/3. Table 6 shows the file in terms of the 28 documents in the file and Table 7 the file folder broken down according to image-page content. In Table 6 column (α) contains the T2 relative documents from 1-28 to 28-28, column (β) contains the total number of T2 pages in each document, column (γ) contains the title and/or first sentence of the document. Columns (δ) and (ϵ) contain the conventions of Wren Trinity and Bharadwaj-Garegnani, respectively, in order of pagination.

Table 7 breaks the file down into the individual archived pages: column (a) is the T2 convention; here also is included the electronic Wren Trinity (eWT) numeration schema necessary for the images uploaded on the Janus portal; column (b) the WT convention, column (c) the BG convention, and column (d) the title and/or first sentence of the archive. It is from this table that the previous one was constructed.

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Table 6: Aggregate breakdown of documents across conventions for D3/12/3: Notes London November 1927

(α) <u>Trinity 2.0 doc</u> (Prefixed by D3.12.3...; links take readers to T2 docs)	(β) <u>Trinity 2.0</u> (Total number of T2 pages document))	(γ) <u>Title and/or first sentence</u>	(δ) <u>Wren Trinity</u> (Prefixed by D3/12/3...)	(ε) <u>Bharadwaj-Garegnani</u> (Prefixed by A4...)
0-28	1	Notes London Summer 1927 (Physical Real Costs etc.)	77	A4 [1-28]
1-28	2	How useless the notions of utility and disutility are...	1, 1v	1, 1ii,
2-28	2	4) Demand curves are a truism, or false....	2, 2v	2, 2b
3-28	3	Dim. Ret...Improvements in agriculture...Origin of law of Dim. Ret.: Cannan...Marginal Average: West, Pigou, Edgeworth...	3, 3v, 4	3, 3ib, 3ii
4-28	21	General Scheme	5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25	4i, 4ii, 4iii, 4iv, 4v, 4vi, 4vii, 4viii, 4ix, 4x, 4xi, 4xii, 4xiii, 4xiv, 4xv, 4xvi, 4xvii, 4xviii, 4xix, 4xx, 4xxi
5-28	1	"Ricardo, Principles; p. 166 "Many of the errors in political economy have arisen from errors on this subject..."; {SC 5256; GdV 4927, p. 490; this is page 274 in Sraffa's <i>Works I</i> ; see <i>Table of Corresponding Pages, Works I, p. 446</i> }	26	5
6-28	2	Marshall, p. 837; Ricardo, p. 104-5; Ricardo has in respect of tithe made the same mistake as Marshall blamed Mill (assuming that the curve of the product is a right line)" {Marshall SC 2591 GdV 3810 p. 373; Ricardo SC 5256; GdV 4927, p. 490}	27v, 27	6b, 6
7-28	1	Sidgwick; 204... {The principles of political economy, SC 2059, GdV 5405 p. 535}	28	7
8-28	2	J. Moret: les prix et la theory general de l'equilibre...	29, 30	8i, 8ii
9-28	1	Edgeworth, Papers... {SC 2695; GdV 1501, p. 149}	31	9
10-28	1	Marshall, Econ. of Industry...	32	10
11-28	1	The difference (between the T.V and theory of price) may be shown thus:...	33	11
12-28	1	The Austrian or Hendersonian conception may be righ[t] in the general theory and the Wicksteedian be wrong in the particular theory...	34	12
13-28	2	Auspitz + Lieben, Ch, 1+2 {SC 2011; GdV 141, p. 15}	35, 36	13i, 13ii
14-28	4	We shall mainly be concerned with the study of the causes of the determination of the price of an individual commodity, considered separately from all others...	37, 38, 39, 40	14i, 14ii, 14iii, 14iv
15-28	1	We shall first of all clearly to define the purpose of our inquiry...	41	15
16-28	7	Physical real costs	42, 43, 44, 45, 46, 47, 48	16i, 16ii, 16iii, 16iv, 16v, 16vi, 16vii
17-28	3	Measure of real costs; Pigou - Laws of incr. + dim. costs E.J. 1927, § 3-5...	49, 50, 51	17i, 17ii, 17iii
18-28	4	Bukharin - Leisure Class..." {SC 3672; GdV 588, p. 57}	54, 55, 56, 57	18i, 18ii, 18iii, 18iv

19-28	3	Difficulty of attainment cause of value; Scharling (in BB, 221-2)... {"BB" refers to Bohm-Bawerk's Positive Theory of Capital, SC 2028; GdV 429, p. 42; the Scharling reference is in a footnote by Bohm-Bawerk}	52, 52v, 53	19i, 19ib, 19ii
20-28	2	General + Particular T.V.	58, 59	20i, 20ii
21-28	11	Distinction between two T.V.	60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 69v	21i, 21ii, 21iii, 21iv, 21v, 21vi, 21vii, 21viii, 21ix, 21ix, 21xb
22-28	1	Disutility and negative utility	70	22
23-28	1	If in the net product of a horse his food is not included, while it is in the net product of a man, this will obviously lead us to employ a much greater amount of men and smaller of horses...	71	23
24-28	1	Cannan, Review of Henderson's Supply + Demand..." {Henderson SC 2273; GdV 2487, p. 249}	72	24
25-28	1	Tavorozzo; Demand and price of coffins, wedding cakes...	73	25
26-28	1	Suggestions for reading...	74	26
27-28	1	Are we justified in giving to land a peculiar place in econ theory?	75	27
28-28	1	Conditions of supply + demand curves:...	76	28
	$\Sigma = 82$		$\Sigma = 82$	$\Sigma = 82$

Table 7: Disaggregate breakdown of image-pages across conventions for D3/12/3: Notes London November 1927 (Physical Real Costs, etc.)¹⁹

(a)	(b)	(c)	(d)
Trinity 2.0 D3.12.3	Wren Trinity D3/12/3	BG A4	Title
0-28.1-1	84	A4	File folder
1-28.1-2	1	1.i	How useless the notions of utility and disutility are...
1-28.2-2	1v	1ii	All text books start by a warning to distinguish common + technical sense of utility
2-28.1-2	2	2i	4] Demand curves are a truism, or false...
2-28.2-2	2b	2ib	makes all the difference if we take them into account we get an entirely different result
3-28.1-3	3	3i	Dim. Ret.: "botanical law: v. "econ. law"; Wicksteed:
3-28.2-3	3v	3ib	descriptive curves v. functional curves.
3-28.3-3	4	3ii	Utility
4-28.1-21	5	4i	General Scheme
4-28.2-21	6	4ii	The adventures of the T.V. The problems which were prominent in the mind of older economists were the national wealth, and later its distribution...

¹⁹ Whenever possible references to volumes that appear in Sraffa's vast library will be made. The definitive edition of Sraffa's library appears in de Vivo (2014). In this particular reference to Ricardo's *Principles*, the edition consulted here appears as Sraffa Collection SC 5256, which according to the alphabetization scheme in de Vivo (2014) is GdV 4927, appearing on page 490 of that work.

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4-28.3-21	7	4iii	...It always happens with discoveries: and, as always, it's later found that unsuccessful predecessors has already discovered the whole thing...
4-28.4-21	8	4iv	...Ludicrous belief that Marx says "labour is the only cause of value, therefore all value must go to labour"...
4-28.5-21	9	4v	The introduction of the concept of equilibrium, which wiped out the old primitive notion that there had to be somewhere or other on single, ultimate cause of value...
4-28.6-21	10	4vi	...At present we have a separate theory of distribution: we do give to it a very great importance, but we recognize that besides it there is a different, but also very important question - the fixing of prices of single articles...
4-28.7-21	11	4vii	Two questions cannot be treated simultaneously: different general assumptions and different methods of analysis are required.
4-28.8-21	12	4viii	1] Introductory...Sketch of development of theory of value...Distinction between two meanings of "theory of value"
4-28.9-21	13	4ix	The very concept of "theory of value" has undergone a deep transformation, according to the problem which most intensely attracted in each period the attention interest of economists.
4-28.10-21	14	4x	The labour theory of value was devised by Ricardo as a stick to beat landlords (rente (rent does not enter into cost of production))
4-28.11-21	15	4xi	But later, having been adopted by Marx to beat the capitalists, it was necessary for defenders of the present system to devise a new theory, the utility theory of value.
4-28.12-21	16	4xii	Another curious example of this curious phenomenon to which shall come across is that of the law of diminishing return; having been discovered by Turgot, and again by Anderson, it was suddenly simultaneously rediscovered by West, Malthus, and Ricardo,...
4-28.13-21	17	4xiii	In this general problem we must find some ultimate standard, independent from the variables we are considering, such as utility or disutility of labour.
4-28.14-21	18	4xiv	But if we can find our inquiry to such a question as that of how, being given all the prices and amounts consumed and produce of all other commodities,
4-28.15-21	19	4xv	...The diminution of demand price trough {sic} an increase in quantity available is an empirical law, based on observation, and inferred from it.
4-28.16-21	20	4xvi	Considering the wide differences between the two theories of value (which, by the way, far from being contradictory, simply are attempts to solve altogether different questions) it would be convenient to designate them by different names...
4-28.17-21	21	4xvii	...is generally believed that a holding certain views on one of them is necessarily implies the holding of "corresponding" views on the up on the other...
4-28.18-21	22	4xviii	Confusions arising from mixing up of two theories of value....
4-28.19-21	23	4xix	This does not meet the objection - so long as demand price is affected by the presence of substitutes (and it will always be, however comprehensive the definition we give a commodity because chiefly at the margin,...
4-28.20-21	24	4xx	Should Pareto's doctrine general equilibrium be classed as belonging to the first on the second Theory of value?
4-28.21-21	25	4xxi	It should be clearly understood that I am not referring to two schools holding different theories of value. There are hundreds of schools with hundreds of theories of value. What I mean is that there are two distinct problems which confront us;
5-28.1-1	26	5	Ricardo, Principles; p. 166 'Many of the errors in political economy have arisen from errors on this subject...; {SC 5256; GdV 4927, p. 490; this is page 274 in Sraffa's Works I; see Table of Corresponding Pages, Works I, p. 446} *
6-28.1-2	27v	6ib	Marshall, p. 837; Ricardo, p. 104-5; Ricardo has in respect of title made the same mistake as Marshall blamed Mill (assuming that the curve of the product is a right line) {Marshall SC 2591 GdV 3810 p. 373; Ricardo SC 5256; GdV 4927, p. 490}
6-28.2-2	27	6i	Marshall, p. 837; Ricardo, p. 104-5 {con't}
7-28.1.1	28	7	Sidgwick; 204... {The principles of political economy, SC 2059, GdV 5405 p. 535}
8-28.1-2	29	8i	J. Moret: les prixet la theorie generale de l'equilibre...
8-28.2-2	30	8ii	ditto

9-28.1-1	31	9	<u>Edgeworth</u> , Papers... {SC 2695; GdV 1501, p. 149}
10-28.1-1	32	10	<u>Marshall</u> , Econ. of Industry...
11-28.1-1	33	11	The difference (between the T.V and theory of price) may be shown thus-...
12-28.1-1	34	12	The Austrian or Hendersonian conception may be righ[t] in the general theory and the Wicksteedian be wrong in the particular theory...
13-28.1-2	35	13i	Auspitz + Lieben, Ch, 1+2 {SC 2011; GdV 141, p. 15}
13-28.2-2	36	13ii	ditto
14-28.1-4	37	14i	We shall mainly be concerned with the study of the causes of the determination of the price of an individual commodity, considered separately from all others...
14-28.2-4	38	14ii	In the other hand, cost of production would be only the loss of ability remuneration involved in not using them
14-28.3-4	39	14iii	...We can no more rely refer the costs and utilities of one article to the costs and utilities of another one...
14-28.4-4	40	14iv	Variations in costs in one commodity arise only from changes in the coefficients of production, i.e. in the proportions in which different factors are employed enter into the productive process.
15-28.1-1	41	15	We have first of all clearly to define the purpose of our inquiry. It is therefore necessary to distinguish the different conceptions that are underlying in all theories of value...
16-28.1-7	42	16i	Physical real costs All the ultimate standards we have considered up to this point are psychological that is to say, theyir are tested by the w is the willingness of consumers or producers to make a sacrifice in order to obtain a utility.
16-28.2-7	43	16ii	What happens then if, as it is necessary in a quest of an ultimate standard, we go so far as to consider the whole of the commodities and produced, and the efforts incurred at one and the same time?
16-28.3-7	44	16iii	This conception would the tenable only if all the commodities considered (or at least one of them) had, each of them no possible substitute
16-28.4-7	45	16iv	...There is however, something to be said for this conception of real cost. It is true that there is an infinite number of combinations of commodities which would be "the minimum" necessary to support permanently a labourer...
16-28.5-7	46	16v	...working 8 hours a day at a given standard of efficiency...
16-28.6-7	47	16vi	Thus to Ricardo's T. V., based on amount of labour, two interpretations can be given: 1) the subjective psychology, disutility one, 2) the objective physical necessities of existence one...
16-28.7-7	48	16vii	ditto
17-28.1-3	49	17i	Measure of real costs; Pigou - Laws of incr. + dim. costs E.J. 1927, § 3-5...
17-28.2-3	50	17ii	If by real cost P. means expenses of production (which from the content seems more probable) one does not see why they should be measured in terms of one factor...
17-28.3-3	51	17iii	...raise the old question: if la was worth 1b, and is now worth 2b, has a risen or b fallen in value? rather, the question raised in the article is worst and seems to be: is a + b worth more or less than before?
18-28.1-4	54	18i	"Bukharin - Leisure Class
18-28.2-4	55	18ii	The distinction between "social" and "individual" point of view in economic theories is here extremely well put...
18-28.3-4	56	18iii	When the transformation began. First, Marshall discovered that it was impossible to sum up individual dim. costs curves in regime of competition - and introduced external economies,
18-28.4-4	57	18iv	Thus utility and disutility, as quantities that have their origin (are located) in the psychology (conscience) of the individual have are being gradually expelled from the field of the determination of the value of single commodities.
19-28.1-3	52	19i	Scharling thinks ultimate determinant of value is "the exertion (Austrengung) which is spared the man who wishes to obtain possession of a good by the fact that the good is transferred to him, in the case in question, by the other parity in the exchange"

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19-28.2-3	52v	19ib	Surely no “exertion” can substitute the right of a famous painting: the price I am prepared to pay cannot be said to be equivalent to the effort I should make to paint a similar one.
19-28.3-3	53	19ii	Scharling says value is determined by "difficulty of attainment" by this he means “the amount of effort that every one must take on himself to obtain a good, or the effort which is spared him by the possession of the good”
20-28.1-2	58	20i	General + Particular T.V.
20-28.2-2	59	20ii	ditto
21-28.1-11	60	21i	Distinction between two T.V. Supply Curves of commodities are not at all related with to disutility curves then demand curves are utility curves.
21-28.2-11	61	21ii	We could only say that the price of those commodities is only determined by “the conditions of supply”, i.e. by the wages, interest, rents that have to be paid for its production, and that demand price has nothing to do with its determination.
21-28.3-11	62	21iii	Ultimately, it is possible that supply were absolutely fixed, as for Marshall's stones (details): supply price would determine nothing, all would be determined by demand price and scarcity.
21-28.4-11	63	21iv	We are first explained in detail the notion of wants, their satisfaction, goods as the means of their satisfaction, utility as the result of such satisfaction, diminishing utility and its reasons (expand).
21-28.5-11	64	21v	We thus are led now into the notion that the demand curve for one commodity is determined by its absolute utility, that demand price for each several quality is with minor correction, proportional to the marginal utility of that quantity.
21-28.6-11	65	21vi	And this shows how dangerously misleading is practice of deducing demand curves from utility curves.
21-28.7-11	66	21vii	Therefore the demand curve is strictly dependent, not only on utility, but on all other prices, which we dont know how are determined, all simultaneously in this way!
21-28.8-11	67	21viii	...we might say that the equilibrium of all commodities is simultaneously determined by one system of equations. This is Walras and Pareto's system.
21-28.9-11	68	21ix	This is so true, that Pareto himself (though personally not giving up the belief in utility) has found it necessary to make his general system independent of utility and base it on empirical {sic} indifference (i.e. demand) curves.
21-28.10-11	69	21x	But there are two other important considerations, which remove still further demand from utility. The first is discontinuity: of most commodities we consume one unit, and no more, or nothing - and here dim. utility has nothing to do with falling demand price; of many others, though we might graduate quantity (sigarettes {sic}) we dont...
21-28.11-11	69v	21xb	I want to make it clear that in this course I am not giving to the discussion of questions, an amount proportional to their importance; but rather, proportional to what you are likely to have overlooked.
22-28.1-1	70	22	Disutility and negative utility
23-28.1-1	71	23	If in the net product of a horse his food is not included, while it <u>is</u> in the net product of a man, this will obviously lead us to employ a much greater amount of men and smaller of horses...
24-28.1-1	72	24	Cannan, Review of Henderson's Supply + Demand... {Henderson SC 2273; GdV 2487, p. 249}
25-28.1-1	73	25	Tavolorzso; Demand and price of coffins, wedding cakes...
26-28.1-1	74	26	Suggestions for reading...
27-28.1-1	75	27	Are we justified in giving to land a peculiar place in econ theory?...
28-28.1-1	76	28	Conditions of supply + demand curves:...

As T2 is designed as an online digital arrangement, all documents and pages in the various tables will be hyperlinked to the material throughout the archive. Readers will be able to click on the various files, documents, and pages and have returned a tandem screen containing the digital image of the material as well as a complete electronic transcription of the content to allow for direct copy-and-paste, including equations which are saved as image files.

The digital environment and user interface within which Trinity 2.0 is constructed uses freely available Google apps, specially Google presentations and Google docs. This technology is relatively simple, taking the form of slideshow presentations of varying length. An example of user interface is seen in the image below (note that Appendix 2 contains links to the the first 13 T2 files of material from the 1920s):

Image 2: User interface for Trinity 2.0 using Google slideshow

The screenshot shows a Google Slideshow interface. At the top, the title is "D3/12/3:(e)Tr Notes London 1927 (Physical Real Cost, etc.) (Trinity 2.0)". Below the title is a menu bar with options: File, Edit, View, Insert, Format, Slide, Arrange, Tools, Add-ons, Help. The main content area is divided into two parts. On the left, there is a vertical list of slide thumbnails numbered 25 through 29. The central part of the interface displays a handwritten manuscript page with a transcription on the right. The transcription includes a numbered list item: "2. The introduction of the concept of equilibrium which wiped out the old primitive notion that there had to be somewhere or other one single, ultimate cause of value, besides its immense scientific importance which it had in itself, brought with it the great practical advantage that being to a certain extent compatible with both schools of thought, it introduced their doctrines; it closed the old gates - away and brought back the T.V. from the field of politics to that of economic theory. This was now only the consequence of the conciliation represented by the scissors, but also of the fact that it put as the problem to be solved by T.V., not the question of the cause of the value of all commodities together, but the determinants of the value of any article considered separately, and regarded as independent from all the others. This in fact was only the last step in a development which had been in progress for a long time. But the contrast between the idea we have to-day of the question of value and that of Ricardo and his contemporaries is impressive. P.E. you think is an inquiry into the nature and cause of wealth, I think it should rather be called an inquiry into".

The respective conventions for each archive is placed at the top left of the transcribed right-hand side page according to the following taxonomy of conventions given in Table 8 below:

Table 8: Taxonomy of Archival Conventions in General and for Specific Archive Page Under Discussion

<i>Taxonomy of Archival Conventions in general</i>	<i>Taxonomy of Archival Conventions for specific archive</i>
D3.12.Φ _j δ _i - δ _Σ . π _i - π _Σ (Trinity 2.0 image-page) [Wren Trinity].[Bharadwaj-Garegnani]	D3.12.3 4-28.4-21 [D3/12/3:8].[A4.4iv]

Having an electronic version of the entire archive is especially useful for in-text searching.²⁰ This greatly facilitates the construction of an interactive online index of the material very much inspired by the manner Sraffa indexed his Ricardo in *Works XI*, literally the last constructive endeavor he would embark upon with its completion in 1974. The Index for Trinity 2.0 currently under construction is inspired by *Works XI* and with the new technology we are able to take it further in that the actual entries are hyperlinked to their appropriate place within the archive.

5. Conclusion

We are at the cusp of tremendous change in Sraffa archival scholarship. The online availability of the material in its raw form is a very significant development indeed. Scholars from all walks and theoretical persuasions as well as informed lay-people alike can now study deeply the profound theoretical developments and insights of this mighty thinker. Unfettered, open, and uninterpreted access to Sraffa's archive is vital for a much-needed resurgence of interest in the theoretical and archival legacy of Piero Sraffa. For this revival to happen a sense of cogency also must be brought to the material.

This is precisely what the Trinity 2.0 arrangement is intended to help provide. The organic interface with both WT and BG allows the reader of the archive to gain a rich sense of the material, which is precisely the point of any scientific inquiry, or at least should be. And while a robust archival architecture is important for any set of documents, an archive as complex and deep as Sraffa's necessitates such to gain the most out of the material. This means that the best way to understand Sraffa's Papers is to conceive of the material in terms of *all* the conventions – T2, WT, and BG - in relation to Sraffa's own pagination, as information is there to be gleaned that otherwise would be, and has been, missed.

This is what is meant by “organic interface”, because as much as possible an effective arrangement of the material gets out of the way and lets the material speak for itself. And we count this as a lesson learned by the way Sraffa handled the archival material of [his Ricardo](#), especially the archival

²⁰ Tandem screens that include the image and electronic text that can be copied and pasted are also important safeguards against erroneous, out-of-context, etc., transcription and/or use of the material (see, e.g., Carter 2018).

convention he developed for the Letters in *Works VI-IX*. What Sraffa did in arranging the letters was very advanced indeed. In *Works VI* we have an [Introduction](#) to the four volumes that is a shining example of objective textual and archival scholarship. Sraffa spends time introducing readers to the various correspondents and identifies succinctly in a [table](#) “the distribution of the letters between the main correspondents and their frequency at various periods” ([Works VI, p. xiv](#))

Sraffa arranges the Letters chronologically, archiving them numerically from 1 to 555. This simple schema is then put by Sraffa to use in identifying the trajectory and journey of each letter, culminating with a complete index at the level of the individual Letter broken down by correspondents that appears in a [table](#) at the end of *Works IX*.

The effect of all this was to give Ricardo his voice, as Sraffa tells us in the Introduction:

“In contrast with previously published collections, the letters to and from the various correspondents have been arranged in a single chronological series. The reader is thus placed as it were behind Ricardo’s desk at Gatcomb Park and reads the letters as Ricardo writes them or receives them” ([Works VI p. xiv](#)).

Trinity 2.0 endeavors to give a similar sense of placed being behind Sraffa’s desk, reading as he works through and develops his theory and ideas - ideas which did have and can have again tremendous relevance for economic science, especially given the fact that the issues they raise remain unresolved. Sraffa’s book of less than 100 pages was only a Prelude; we need his thousands-of-pages cogently-rendered archive to finish composing the Symphony. And the sense of Prelude in musical form as applicable to Sraffa’s title is not fanciful at all, as there a “prelude” can be defined as a movement introducing a larger piece or *group of pieces*.²¹ Notice the emphasis on “group”.

This is our reading of what Professor Pasinetti (1988) refers to as the “foundational” character of Sraffa’s inquiries, namely that Sraffa’s robust foundations are appropriable for a variety of theoretical approaches. The musical sense of the word “Prelude” can thus be read into Sraffa’s use of the term too: Marxists, Sraffians, Post-Keynesians, Institutionalists, Austrians, neoclassicals, etc., all will gain from deep study of the Sraffa Papers, as will the science itself. The Trinity 2.0 is an effort to provide a road map to facilitate making this possible thereby allowing Sraffa to finally be heard his own voice.

²¹ Bobbie Horn from The University of Tulsa in private discussions is credited with considering musical form in trying to understand what Sraffa may have meant by ‘Prelude.’

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Appendix 1: Section D3/12: Sraffa's Notes on *Production of Commodities*

1927-32

- D2/4: Lecture Notes on the Advanced Theory of Value (1928-31)
 D3/12/1: Notes and formulae on price
 D3/12/2: Notes w Besicovich and Ramsey (26-55)
 D3/12/3: Notes London Summer 1927
 D3/12/4: Notes for Lecture 1928-31 (Nov 1927)
 D3/12/5: Notes on "Looms" (Winter 1927-28)
 D3/12/6: Notes on surpluses (Winter 1927-28)
 D3/12/7: Notes including on language (1928)
 D3/12/8: Notes mostly equations (Lent 1928)
 D3/12/9: Notebooks on elasticity (1928, 1932)
 D3/12/10: Notebook (Dec 1927 – Mar 1928)
 D3/12/11: Notebook (Nov 1927)
 D3/12/12: Notebook (Summer 1929)
 D3/12/13: Notes on rent & "normal profit" (Oct 1929)

1942-48

- D3/12/2: Notes w Besicovich and Ramsey
 D3/12/14: Notes on compound commodities (42)
 D3/12/15: First equations (w/o surplus) (1942)
 D3/12/16: Notes on [Crosscap] (1942-46)
 D3/12/17: "Prove and finding list" (1942-5)
 D3/12/18: Notes (Aug 1942)
 D3/12/19: Agricultural Schemes (Aug 1942)
 D3/12/20: Models (Aug 1942)
 D3/12/21: Industrial Schemes and misc. (Sep 42)
 D3/12/22: Closed Vertical Combine (Oct 1942)
 D3/12/23: Notation and Formulae used (Oct 1942)
 D3/12/24: Reduction (Oct 1942)
 D3/12/25: Rent (Nov 1942)
 D3/12/26: Value of stock, industrial equations
 D3/12/27: Fixed capital (Nov-Dec 1942)
 D3/12/28: Joint Product (Nov 1942 – Mar 1943)
 D3/12/29: Marginal Products (Dec 1942)
 D3/12/30: Fixed capital – Final (Dec 1942)
 D3/12/31: Small notebook (post Dec 1942)
 D1/91: Black Notebook (1943)
 D3/12/33: Notes (Jan – May 1943)
 D3/12/34: Fixed K & marginal prod (May–Aug 1943)
 D3/12/35: Notes (Sep 1943-Jan 1944)
 D3/12/36: Notes (Jan – Mar 1944)
 D3/12/32: New Models (Jan 1943)
 D3/12/37: Proofs for all-pos.1 product (Apr-Jun 1944)
 D3/12/38: Notes: (Jul-Sep 1944)
 D3/12/39: Notes (Sep 1944 – Jun 1945)
 D3/12/40: Notes (Oct 1944 – Jun 1945)
 D3/12/41: Notes (Nov – Dec 1945)
 D3/12/42: Notes for work after PCMC (1945-67)
 D3/12/43: Notebook w/draft of Preface (post 1945)
 D3/12/44: Notes (Aug 1946-48)
 D3/12/62: Fluctuations of price w/ Δr (1942-56)
 D3/12/63: Pages from folder Oct 1956 (1944-56)

1955-60; 1963; 1967

- D3/12/42: Notes for work after PCMC (1945-67)
 D3/12/45: Balance of Wages and Profits (Nov 1955)
 D3/46: Notes w/ Draft of Preface, etc. (1955-59)
 D3/12/47: Ag. to Ind. schemes; switch (1955-57)
 D3/12/48: Fixed capital (1955-57)
 D3/12/49: Fixed capital and joint prod (1955-58)
 D3/12/50: Rubbish (1955-58)
 D3/12/51: Palma, Jan- Mar 1955 (Jan – Mar 1955)
 D3/12/52: Majorca draft (Mar 1955)
 D3/12/53: Discard (almost certainly) (Su 1955)
 D3/12/54: Notes left Cambridge Sep 55 (Aug 1955)
 D3/12/55: Proof of labour value (Oct – Nov 1955)
 D3/12/56: Drafts on Standard comm. (Dec 1955)
 D3/12/57: Draft of Standard System (1955-56)
 D3/12/58: Prefabricated later chapters (1955-56)
 D3/12/59: Balance of wages and profits (1955-56)
 D3/12/60: Discarded notes on switching (1955-56)
 D3/12/61: Discarded used drafts (1955-56)
 D3/12/62: Fluctuations of price w/ Δr (1942-56)
 D3/12/63: Pages from folder Oct 1956 (1944-56)
 D3/12/64: Discarded notes on St Com (1956)
 D3/12/65: Something useful on joint prod (1956-7)
 D3/66: Notes (1956-58)

- D3/12/67: Notes for Chapters III and IV (1956)
 D3/12/68: Scaffolding (1956)
 D3/12/69: Notes on standard system (1956)
 D3/12/70: Uniqueness of Stand sys (1956)
 D3/12/71: Copy used by typist (Mar 1956)
 D3/12/72: Copy used for 2nd typing (Aug 1956)
 D3/12/73: Switching, rents and income (1957)
 D3/12/74: Self-replacing n. i.; Torrens (1957)
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 D3/12/76: Drafts §§ 43-48 (Jan 1857)
 D3/12/77: Footnote on joint products (Jan 1957)
 D3/12/78: Drafts of §§ 43 - 44 (Mar 1957)
 D3/12/79: Drafts joint products (Mar 19557)
 D3/12/80: Copy typist §7 and §§42-65 (Mar 1957)
 D3/12/81: Ch. IX Effects on Joint Prod. (Mar 57)
 D3/12/84: Agony of non-basics (Jun-Aug 1957)
 D3/12/85: Collapse non-basics & reconstruction
 D3/12/86: Typescript pp. VII and VIII (Aug 57)
 D3/12/87: Non-basic multiple syst (Aug-Nov 57)
 D3/12/88: Ch X Fix Cap & Appendix Sub-sys
 D3/12/89: Ch. VII, VIII, Appendix C (Dec 1957)
 D3/12/90: MS Ch. XII Switch Methods (Dec 57)
 D3/12/91: Ch. IX Effect of joint prod (Dec 1957)
 D3/12/92: Queries to Besicovich (Sep-Nov 1957)

- D3/12/93: Drafts & type non-basics (Nov 57)
 D3/12/94: Letter from Besicovich (23 Dec 57)
 D3/12/95: Acknowledgements in Italian (1957-60)
 D3/12/96: Rent filling last gap (1958)
 D3/12/97: Items for retyping (Aug 1958)
 D3/12/98: Historical Appendix (Feb 1959)
 D3/12/99: Appendix D, typist copy (Feb 1959)
 D3/12/100: Cancelled (1959)
 D3/12/101: Retyped proofs Ch IX, §83 (Apr 1959)
 D3/12/102: Figures, captions, formulae (1959)
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 D3/12/107: Bound first proof (Dec 1959)
 D3/12/108: Second proof (Jan 1960)
 D3/12/109: Cards of index (1959)
 D3/12/110: Graphs and captions (1959)
 D3/12/111: Correspondence (1960-)
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