Translator's Notes.

This translation is part of a larger project, an online library of the works of Leonhard Euler, which has been named The Euler Archive. It was thought that the Eneström Index would be a useful addition to the website and to the world of Eulerian scholarship. Since I had an interest in the project, a basic knowledge of German, and two very good German dictionaries, I was given the task of translating the Eneström Index.

If you are using this index I will assume you know all about Leonhard Euler, the Swiss mathematician who lived from 1707-1783, and wrote all sorts of pieces about all sorts of mathematical and scientific subjects. What you would not have known, if it weren't for Gustav Eneström, the Swedish math historian, was exactly how much Euler had written.

Eneström was the first person to list out every piece of work Euler ever wrote. He fortunately also numbered his list, and these numbers have become a common shorthand for referring to Euler's works. The index was originally published in the 1913 edition of the *Jahresbericht der Deutschen Mathematiker-Vereinigung*. It originally contained 3 sections, as well as a supplement (*Nachträge*) to the first section, an appendix (*Anhang*), and an index.

The first section and it's supplement, which I have translated, are a list of all the pieces Euler wrote ordered by their dates of publication. Each piece is given a separate entry, and an index number. In the notes for each entry, Eneström includes further publication information, and sometimes a brief summary of the piece's subject. The supplement contains additional notes on certain pieces, and a few pieces that Eneström didn't know about when he first made his index. The supplement also contained some corrections of things misprinted in the first section. In this version I have made those corrections.

The second section is ordered by the dates on which the pieces were presumably written, and the third section is organized by subject. These sections only list the titles of the pieces, and they use the numbering system from the first section (See how useful it was, already?). I did not think that these sections added any real information, so I did not translate them. The appendix is a list of the works of Johann Albrecht Euler, Leonhard Euler's son, which I did not translate since the Euler Archive is only concerned with the work of Leonhard Euler. I didn't give my translation an index, because, frankly, I ran out of time.

Eneström also made a second index of Euler's manuscripts and handwritten papers, published in a different volume of the 1913 *Jahresbericht*, but since I really don't know how many of these still exist and where they can be found, I didn't translate this either.

It is quite amazing that after doing such an exhaustive search for Euler's work, and such a carefully organized index, that he didn't write an introduction explaining his system. He did write an extremely thorough introduction to his second index, but it shed little light on his first index. I had one copy of his first index which said that the second edition would contain an introduction as well as additional supplements, but I couldn't find this second edition. So I have done the best I could to make sense of Eneström's cryptic notation. In any case where I didn't know what Eneström was talking about I left it exactly as he printed it (for instance, the note "[o. J.]" in E268).

There were a few words that I had a bit of trouble translating. Eneström spoke quite a few more languages than I do and he would sometimes slip in a Latin phrase, and there's nothing I can do about it. There are also a few German words that could have several meanings, and it wasn't always clear which Eneström meant. The word "Reihe," which literally means "row," can mean either a sequence or a series. And the word "Tafel," can mean a table, or a picture of some sort, or a printing plate, or an entire page of pictures which was printed with a single printing

plate. I have translated this word as "diagram" in most places. This is not perfect, but at least distinguishes "Tafel" from "Figure," which usually means Euler actually labeled the picture "Figure 1," in his piece. Also I was never quite sure what part of a book the "Bogensignatur" was, and have translated that as "inscription."

For the most part I have left things as Eneström wrote them. I did try to preserve the original titles with their original spelling errors intact, and no extra ones added by my careless typing. In many cases I have fully written out things that he abbreviated, and I have changed the format of the entries in an attempt to make the index more readable. I have sometimes changed the order around to make it more standard from entry to entry. I have also Americanized the city names when they were not part of the original titles (for instance, Brussels instead of Bruxelles or Brüssel). Further information about how to read the index, and a guide to abbreviations, can be found in my own introduction.

When I first started this project I heard rumors that Eneström had put amazing secret discoveries somewhere in his index, and I was disappointed to discover that, after all, it was just an index. As I went through and translated, however, I noticed a few things that I thought were unusual or interesting. There are certain patterns to the entries, and when they were broken, it seemed worth noting. You must bear in mind that I have very little background in Eulerian scholarship, and so my observations may be important, or they may be merely the result of the vagaries of those wacky academic journals. For what they're worth, here are my observations:

- Comment. acad. sc. Petrop. (ed. nova) vol. 6 was published in 1743, vol. 5 was published in 1744. (see E223, 24).
- E14 was presented in 1732, and published in 1735 in the volume that was supposedly for the year 1729.
- E68 includes "observations sent in by a clever woman."
- The Latin version of E83 seems to have disappeared.
- E101A: "According to the foreword, the second part should be translated by Kramp, and there is a second title page, but this second part appears never to have been printed; in any case I have not seen any examples of it."
- Some of Euler's works are actually presented twice to the same academy, including E126, 313?, 315, 316?, 323, 340, 351, 359, 430? (with a gap of 7 years between the two presentations), 473
- E137: This *Summarium dissertationum* has a volume number and a year, but none of the others do.
- In E168 Euler is totally lying to d'Alembert who is his rival.
- The pieces were often presented to St. Petersburg in clumps. E133-139 and 167 are all presented on September 2, 1748. And E273, 283-8, 295-7, 301 were all presented on December 1, 1760.
- The Berlin Academy always sees Euler's work before the St. Petersburg Academy does. Is it possible that Euler read them in Berlin as he wrote them and then mailed them to Russia in batches?
- E149A is published by the widow of Gottfried Heinrich Schwan.
- C. G. J. Jacobi has a lot of different titles and dates than the one given by the other records. I think Eneström cites him every single time so that Jacobi's statements can be taken with a grain of salt.
- E229 has 9 figures "of which, admittedly, figure 7 appears to be missing."

- E284 has an 18 year gap between Berlin and Russia. It was read to the Berlin Academy on September 6, 1742 and it was presented to the St. Petersburg Academy on December 1, 1760.
- E309 is published in vol. 15 (the 1759 volume), 310 in vol. 20 (the 1764 volume). It looks like the *Memoires* skipped 5 years so they could print current volumes but also tried to keep up with the old ones. In other words, they are not printed at all in chronological order, and my first observation about the *Commentarii* is no longer as shocking.
- Versions of E388 vary by up to 300 pages, all size 8^0. Some of the translations must have been looser than others.
- Novi comment. acad. sc. Petrop. vol. 15 is published on time! (see E405, for ex.)
- E332 was presented in Berlin on May 6, 1751, and is not published until 1767 (in the supposedly 1760 volume).
- E365: d'Alembert actually publishes something of Euler's. Why?
- Eneström thinks E416 was written by Euler, though the title says "Carolo Euler, Leonhardi filio." He does not give any evidence to the contrary.
- The *Novi commentarii* stops all of a sudden in 1777, right when it was finally being published on time. And then it's replaced by the *Nova acta* in 1778, which stops dead in 1779. These journals are so weird.
- E425 is supposedly for the year of 1771 and printed in 1772, but it was actually presented May 1772. Euler is such a cheater.
- Euler took E445 back a year after he presented it, and then a year after that he presented it again. Was he making corrections?
- E472 is also in a volume that's dated too early, but only by two weeks. However, since so many of the pieces are printed so late because the journals fall hopelessly behind, it does seem suspicious when something is printed ahead, especially since it is known that Euler deliberately cheated on at least one occasion.
- In 1776 a whole bunch of stuff from 1771 is suddenly being printed
- E478 and 479 were presented only 6 days apart. E497 and 498 were only 4 days apart.
- L and J. A. Euler collaborated on E485.
- E501 is printed 9 years late
- E502 is supposedly for the year 1777, printed in 1780, but it was actually presented in 1778. This cheating is becoming rampant. I wonder why Euler didn't cover his tracks better. I mean, if he was in charge of the journal, he must have been in charge of the mysterious records that our dear G. E. keeps citing.
- 1791/1792 the *Nova acta acad.* which was doing so well on catching up the dates now inexplicably skips two years and gets behind again. Ditto 1799/1801.
- There's a footnote to 1792 which talks about a literary fraud where someone tried to pass their own work off as Euler's, which must have fooled a lot of people, since it was reprinted as part of E786.
- The fourth volume of "Institutiones calculi integralis" has no second edition, just first and third.
- I think it is pretty ridiculous that Euler's stuff is published in journals which are supposedly discoveries for the year of 1824 when he has obviously been long dead. I heard they just kept a big stack of his papers in their office, and when they needed extra filler they would just take a bunch of his treatises from the stack.

- E813: I'm not saying this is really all *that* cool, but I do think it is an odd tradition that all numbers for probability problems have to be drawn out of an urn. Was it started by ancient Greeks or someone who actually had urns?
- E788: Euler wrote to Goldbach twice in two days (on August 15 and 17, 1750). What did he have to say that was so urgent?
- E520 is cheating the dates earlier again. So is E523, 524 and 527, and more. It continues after his death though (E537).
- Also there's a lot of good stuff in the supplement.

There are also a few things Eneström did that seem incorrect or inconsistent:

- He only checked the spelling in the titles of languages he knew. My Russian proofreader, Mikhail Akulov, would like to note the following spelling mistakes: "иервой" in E387A[3], "иавигаціи" and "Леоигардомъ" in E426C, and "быдо" in 733A.
- Sometimes the Russian translation of the abstract gets it's own number, like E166a. But in E188-196, it doesn't. Then in like E228a, it does again.
- E418A is listed as an A, but it's not a translation. It should be 418[2].
- In E780 Eneström's got to have written the wrong the page number.
- I believe E718 discusses prime numbers, not composite numbers.

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