Guaranteed Genuine Originals:

The Plimpton Collection and the Early History of Mathematical Assyriology

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Prologue

It may seem odd to offer Christopher Walker a paper with no British Museum tablets in it — but how else is one to surprise him? Among Christopher's greatest contributions to the field are the very many texts he has not published himself but generously given to others to work on, myself included (Robson 1997; 1999). So in order to avoid presenting him with something he knows already, I discuss two other subjects close to his heart. By tracing the formation of the small collection which contains Plimpton 322, the most famous mathematical cuneiform tablet in the world (alas not in the British Museum but now held by Columbia University, New York), I aim not only to explore how the collection came to be, but also to examine attitudes to private collecting amongst early-twentieth century museum professionals, and to reveal a little of the impact the first publication of mathematical cuneiform tablets made on the field of history of mathematics before the First World War. The article ends with an appendix listing the cuneiform tablets in Plimpton's collection, with copies of all his previously unpublished mathematical and school tablets.

Plimpton 322 has undoubtedly been the most debated and most celebrated pre-Classical mathematical artefact of the last fifty years. First published by Neugebauer and Sachs (1945: text A), this Old Babylonian cuneiform tablet shows incontrovertibly that the relationship between the sides of right triangles was systematically known in southern Mesopotamia over a millennium before Pythagoras was supposed to have proved the

theorem now named after him. Its original function is still the subject of great debate in the history of mathematics community (*e.g.*, Buck 1980; Friberg 1981). In the course of my recent work on the tablet, I went to Columbia to collate it and to attempt to identify its provenance. I discovered there a veritable goldmine of letters and documents, spanning the first third of the twentieth century, which not only answered my initial questions but provoked many more. The results of my research on Plimpton 322 have been published elsewhere (Robson 2001; 2002); here, I focus not on the tablet but its owner George Arthur Plimpton, his collaborator David Eugene Smith, and their various Assyriological correspondents including Hermann Hilprecht (who sheds interesting personal light on the controversy surrounding him in Philadelphia at the time) and Edgar J. Banks (who is still harking back to his expedition to Adab for the University of Chicago thirty years after its ignominious end) [Figure 1].

Back to the beginning: Hilprecht's books and Plimpton's letters, 1903–07

In 1903 Hermann Vollrath Hilprecht, newly promoted Clark Research Professor of Assyriology at the University of Pennsylvania in Philadelphia, published the monumental *Explorations in Bible lands* (Hilprecht 1903). Hilprecht had commissioned essays on the nineteenth century scholarship of Palestine, Egypt, Arabia, and Anatolia, but his own substantial contribution ran to some 600 of the 800 pages of the volume. He used fully half of it to describe the recent discovery of a 'temple library' in the ancient Babylonian city of Nippur by the Fourth Pennsylvania Expedition to Nippur under his direction in 1898–1900. This newly-discovered temple library, he claimed, was parallel to, yet a thousand years older than, the famous library of king Aššurbanipal in Nineveh, dating to the 7th century BC, which had been discovered some 50 years previously and now formed the glorious core of the British Museum's cuneiform tablet collection. The Nippur library, Hilprecht hoped, would not only make his own name but secure the reputation of American scholarship in the race for interpretation and intellectual 'ownership' of the ancient Near East. Equally importantly, he was staking that claim for Philadelphia, his adoptive home, over Chicago, whose long-planned expedition to Babylonia was only just getting off the ground. That very same year its leader Edgar J. Banks had finally received a *firman* to excavate ancient Adab, by no means Chicago's first choice of site.

Amongst the key evidence for the temple library, Hilprecht felt, was "a complete set of multiplication tables," whose existence, "sometimes in several copies, speaks volumes for the height of that ancient civilization" (Hilprecht 1903: 531). He accurately described their very standardised contents, with multiplicands 1–20, 30, 40, and 50, and three consistent formats corresponding to Types A, C, and A′ of Neugebauer's definitive categorisation two decades later (*e.g.*, Neugebauer and Sachs 1945: 20). He listed 16 of the standard head numbers (we now know there were 40), but as the relative nature of the sexagesimal place value system had yet to be recognised he understandably interpreted two-place numbers such as 22 30 as integers, namely 1,350, not $22\frac{1}{2}$. Hilprecht does not appear to have come across tablets containing sequences of multiplication tables in descending order of head number, later dubbed 'combined' tables by Neugebauer (*e.g.*, Neugebauer and Sachs 1945: 24), for he understood the catch-line '1;12 (×) 1 (=) 1;12' at the end of a 1;15 times table to "indicat[e] that all the multiplication tablets from 720 to 750 (probably even to 780) were classified in the library as one series, known under the name 'Series 720×1.'"

Figure 1 (clockwise from top left): George A. Plimpton, David E. Smith, Hermann V. Hilprecht, and Edgar J. Banks[1]

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1   Plimpton (1993: frontispiece), Smith (1936: frontispiece), Hilprecht (1909: frontispiece), Banks (1912: frontispiece).

The tables, he surmised, served as aids to astronomical calculation, much as logarithmic tables did in his own day. This unprecedentedly detailed, and mostly remarkably acute, survey was accompanied by a photograph of the 6 times multiplication table CBS 3335 (Hilprecht 1903: 531; 1906: no. 2). It was the first time that Babylonian mathematics had been presented accessibly to the general public.

Hilprecht (1859–1925) was German by birth and like many of his generation had studied with Delitzsch in Leipzig, coming to the United States in 1886 (Foster 1999*b*; 2000). After a short stint lecturing in Egyptology at the University of Pennsylvania he was appointed to a professorship of Assyriology over the local candidate Morris Jastrow (Weschler 1999). Hilprecht participated in the university-affiliated first Babylonian Expedition to Nippur in 1888–89 and led the fourth in 1898–1900. Shortly after the death of his first wife in 1902 he married a rich local heiress, the widowed Sallie Crozer Robinson, thereby ensconcing himself in Philadelphia high society.

In 1903, then, Herman Hilprecht had reason to feel pleased with himself: he had acquired new status through his marriage, promotion, and publication, and the appointment of a new assistant in the person of his former student Albert Tobias Clay (Foster 1999*a*). His new book was reviewed in the major American papers[2] and attracted the attention of a wide public, avid for news of modern America's intellectual involvement in the recovery of one aspect of their distant cultural past. His own substantial contribution was reprinted the following year as *Excavations in Babylonia and Assyria* (Hilprecht 1904). He received many admiring notes and letters, from church groups, school teachers, and other interested individuals who wished to know more about the lost world he described, and in particular how to obtain examples or facsimiles of the cuneiform tablets whose photographs had adorned his book. Some of those letters are preserved in the University Museum archives; evidence of the work they generated for Hilprecht can also be found in a letter from him to William H. Furness, secretary to the Department of Archaeology:

> Several times this year questions have been asked with regard to casts of Babylonian objects — mostly having a biblical reference. Either the applicants (mostly schools) desire them as a gift or are ready to pay for them a moderate prize (*sic*). (HVH03)

Hilprecht asked for clarification about the conditions of presentation or sale, setting prices for such objects "as it is done in all the great museums," requesting permission to draw up a pre-printed price list.

Among his correspondents at this time was one George A. Plimpton, Esq., of New York City, who wrote to Hilprecht on 18 October 1904:

> In your excavations, have you ever found anything that was used by children in teaching them the letters of the alphabet or in teaching them numbers? I have a collection of school books illustrating the growth of education and I want to perfect it, especially in regard to the early nations, Nineveh, Babylon and Egypt. If you can put me on the track of anything of this sort, I shall be very much pleased. (GAP01)

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2   For instance *The New York Times Saturday Review of Books and Art* carried a prominent and favourable review on 14 March 1903 (page 167), focussing especially on Hilprecht's inferences about scribal education at Nippur and concluding that Hilprecht "treats the whole subject as he should, in the light of a careful and competent archaeologist."

Hilprecht replied by referring to his Explorations and offering photographs of a 6 times multiplication table and "an exercise of the letter a" (HVH01).[3] This did not satisfy Plimpton, however, and he wrote again almost immediately, reiterating his request and his position more forcefully:

> I have illustrated the growth of education from the text-book standpoint; in other words, I have a library of perhaps 30 manuscripts on arithmetic and then the first arithmetic ever printed in each country, and so on down to the present time. Now, what I would like would be one of the exercise tables such as were used in Babylon or Nineveh, and it occurred to me that possibly you might be able to put me on the t[r]ack of where I could buy such a thing. Of course, if I cannot get an original, then I should like very much to have photographs of them. Professor David Eugene Smith of Columbia University is writing the history of my library and I should be glad to have the original material if possible. Eventually I intend the books for one of the libraries in this city. Possibly you know where I can purchase this sort of material.
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>   Some time when you are in the city I should be delighted to show you my collection. (GAP02)

Plimpton, then, was no ordinary inquirer: he was persistent, he knew what he wanted and had the means to get it. Almost exactly four years older than Hilprecht, Plimpton (1855–1936) had been a director of the highly successful New York publishers Ginn and Co. for over twenty years. Under his aegis the firm had begun to specialise in educational textbooks and had been conspicuously successful. Plimpton, as a result, was a very rich man looking for ways to spend some of his surplus wealth. He was involved in various forms of charitable giving (Plimpton 1993: 13), but had also become obsessed by collecting. Interested in Americana since he was a child in Massachusetts, he had later been led by his professional interests towards the history of the American textbook, broadening to early textbooks worldwide in the mid-1880s (Plimpton 1993: 51–67). His collaboration with David Eugene Smith (1860–1944) was sparked by a shared interest in books and collecting and had begun in earnest when Smith was appointed professor of mathematics at Teachers College of Columbia University in 1901 (Donoghue 1998: 361). Smith was not only a first class mathematics educator, developing "the first genuinely professional course" for training secondary school mathematics teachers in the United States (Lewis 1999) and writing influentially on the subject (*e.g.*, Smith 1900). He was also a man of letters, with a degree in art and classical languages and a doctorate in art history. Smith soon encouraged Plimpton to narrow the focus of his hitherto disparate collection by aiming to "get a complete set of books in arithmetic published before some given time, as 1550. … Such a collection would be unique."[4] Plimpton took this advice so seriously that within a few years, with Smith's astute recommendations "always balanc[ing] rarity and importance … against price," he had amassed "the world's largest and most complete collection of pre-17th-

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3   The "exercise of the letter a" was presumably something like CBS 10517 (Tinney 1998: 42 fig. 4) which preserves six columns of up to 35 lines each, consisting entirely in a vertical wedge followed by the cuneiform sign A, while the multiplication table must be CBS 3335 (Hilprecht 1903: 531 [photo]; 1906: no. 2).

4   Letter from Smith to Plimpton, dated 22 January 1902, now at Columbia, cited by Donoghue (1998: 362).

century printed arithmetics" (Donoghue 1998: 362).[5] It was only natural therefore, that he should seek to expand his collecting horizons as far as he possibly could.

Hilprecht seems to have grown weary of Plimpton's persistence, however, for he answered brusquely the following day, "I do not know of anybody who sells the kind of tablets desired" (HVH02). It is hardly surprising that Hilprecht was perhaps less attentive than he could have been to the queries of the public, for by this time he was caught in a storm that had become the talk of Philadelphia and much of American academe, and which later became known as the Peters-Hilprecht controversy. This much-analysed furore (*e.g.*, Ritterband and Wechsler 1981; Kuklick 1996: 123–40) had arisen over Hilprecht's *Explorations in Bible lands*, which had, his detractors claimed, overplayed his own part in the Nippur expedition at the expense of the American participants. Worse, it had also led the non-expert reader to believe that illustrations in the book, such as that of the multiplication table (Hilprecht 1903: 531), were finds from the putative temple library while they had in fact been found in other excavations (on the other side of the site, as in the case of the multiplication table) or even purchased in Baghdad (Peters 1905: 154). Further, Hilprecht had no grounds on which to base his claim for a library as he had not been at Nippur when the tablets were discovered and had not yet unpacked them from their shipping crates (Kuklick 1996: 127–8). The highly charged atmosphere is well illustrated from an undated, anonymous document now housed in the Archives of the University Museum, Philadelphia (HVH05). A skit on a traditional English nursery rhyme, it reads (with the original shown for comparison on the right):
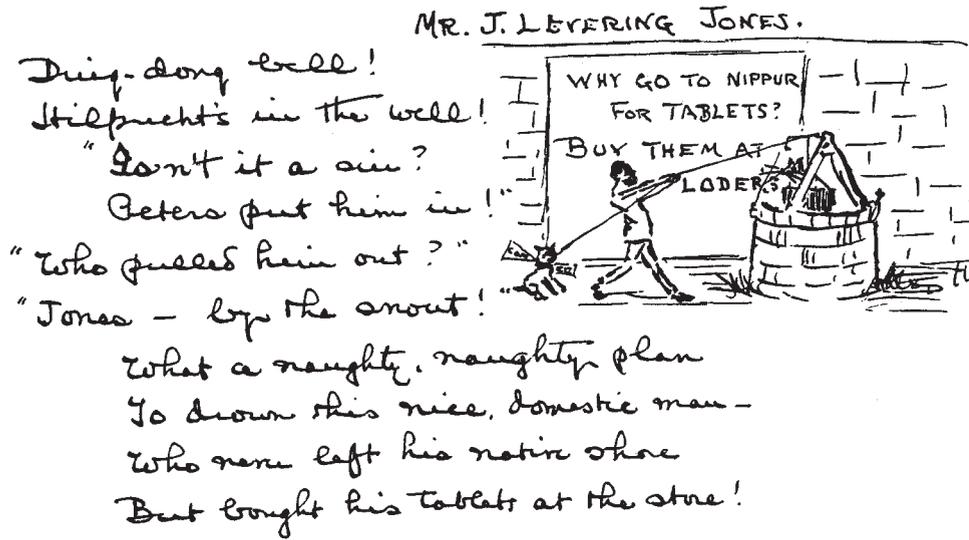
Ding-dong bell!	Ding-dong bell!
Hilprecht's in the well!	Pussy's in the well!
"Isn't it a sin?"	"Who put her in?"
"Peters put him in!"	"Little Johnny Green!"
"Who pulled him out?"	"Who pulled her out?"
"Jones — by the snout!"	"Little Tommy Stout!"
What a naughty, naughty plan	What a naughty boy was that
To drown this nice, domestic man—	To try to drown poor pussy cat—
Who never left his native shore	Who never did him any harm
But bought his tablets at the store!	And killed the mice in his father's barn!

At the top right corner is a sketch of a man, labelled "Mr J. Levering Jones," heaving a large cat (Hilprecht) out of a well in a bucket. Behind them looms an advertising hoarding on a wall, which reads,

Why go to Nippur for tablets?
Buy them at Loder's

Underneath it all is a note "(The above gives a general idea of the dinner card wh. was very large & finished in color.)." The "Peters" in line 4 of the rhyme is John Punnett Peters, Hilprecht's erstwhile archaeological collaborator on the Nippur expedition and now chief accuser, while "Jones" refers to Levering Jones, a lawyer, museum trustee and Hilprecht's

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5   Smith's catalogue of Plimpton's collection, *Rara arithmetica* (Smith 1908; 1939) became a standard reference work. By the time the collection was bequeathed to Columbia it contained over 16,000 items (Lohf 1985).

MR. J. LEVERING JONES.

WHY GO TO NIPPUR
FOR TABLETS?
BUY THEM AT
LODER'S

Ding-dong bell!
Hilprecht's in the well!
"Isn't it a sin?
Peters put him in!"
"Who pulled him out?"
"Jones — by the snout!"
What a naughty, naughty plan
To drown this nice, domestic man —
Who never left his native shore
But bought his tablets at the store!

[The above gives a general idea of the dinner card wh. was very large & finished in color.]

Figure 2: Anonymous sketch of a dinner card, Philadelphia *c.* 1905–08 (HVH05)

most vociferous Philadelphia supporter (Kuklick 1996: 132). Loder's was a druggist's, owned by one Constantine C. A. Loder, in the fashonable Aldine Hotel as 1541 Chestnut Street (Boyd's 1910: 1202). A pun on "tablets" of the medical and cuneiform varieties was clearly intended.[6]

Sadly we know nothing of the organisers and attendees of the anti-Hilprecht dinner that this card was commissioned for, although Morris Jastrow, Hilprecht's erstwhile competitor for the professorship, was among the most vocal of his local opponents (Kuklick 1996: 128). The rhyme's ironic tone speaks volumes about the strength of feeling against him in Philadelphia during the affair — which ran until Hilprecht's messy resignation at the end of 1910 (Ritterband and Wechsler 1981: 11–12; Kuklick 1996: 138).

In an attempt to justify his claims in the face of increasing attacks, in December 1906 Hilprecht published a volume called *Mathematical, metrological and chronological tablets from the temple library of Nippur* (Hilprecht 1906). While it did little to prove the point he wanted to make, in that it provided no further hard evidence of the library's existence, it was a major milestone in the development of mathematical Assyriology. According to his survey of the previous literature, just 24 mathematical and metrological tablets had been published hitherto, all from the British Museum, the Vorderasiatisches Museum in Berlin, and the French excavations at Sippar. Fully half of them were metrological lists and tables, while the rest we would now describe as compilations of mathematical problems (2 tablets), multiplication tables (2 tablets), tables of squares, inverse squares, and inverse cubes

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6   There were also rumours at the time that "Hilprecht had never gone to Nippur at all but had had the tablets manufactured across the river in New Jersey and just pretended he'd been to Mesopotamia" (B. Foster pers.comm. 8 February 2002, 6 March 2002).

(5 tablets), and a calculation (Hilprecht 1906: 11–13).[7] The new volume almost tripled the known corpus, adding 44 tablets to the group, including the hitherto unknown 'combined' multiplication tables and reciprocal tables, as well as contributing to all other genres, including calculations and compilations of problems.

In the second of four introductory chapters Hilprecht also laid out his interpretation of the mathematical tablets, which had advanced significantly in the three years since *Explorations in Bible lands*. He reiterated his findings on the three formats of the multiplication tables and drew attention to the colophons found on a few of them. In the light of the 'combined' tables he now correctly understood catchlines to "indicat[e] the next lowest multiplication table of the whole series" but had yet to realise that the sexagesimal place value system could represent fractional values as well as integers. (Hilprecht 1906: 18–19). The 'combined' tables had also led him to deduce correctly that "such multiplication tables are confined to certain numbers," that the series always runs in descending order, and that "besides 3 and 5, no undividable number or its multiple is multiplied" (Hilprecht 1906: 20). In other words, he was not far off the full understanding of their construction given by Neugebauer (1930–31). What held him back were the reciprocal tables. He had four exemplars, none of them complete, but with enough data between them to allow him to compile a composite text. He spotted that many of the head numbers from the multiplication tables also appeared in it:

> This interesting text may be described as a division table, containing the divisors of 12,960,000 (= 60^4 or 3600^2) to 72 in an increasing series (the left numbers), together with their corresponding quotients in a descending series (the right numbers). If we continued the calculation still further we would obtain all the numbers found in our list of multiplication tables and many additional numbers, which doubtless formed part of the complete series of multiplication tables. (Hilprecht 1906: 21–22)

He identified 12,960,000 as the so-called 'Platonic' or 'nuptial' number of Plato's *Republic* VIII, 546b–d (Adam 1891) and which featured prominently in late antique and medieval neo-Pythagorean numerology (Allen 1994). His long discussion concluded with the comment that:

> For the present it must suffice by means of the Nippur tablets to have traced its origin to Babylonia and to have connected it with the fundamental Babylonian doctrine, according to which the same divine power manifests itself harmoniously in all parts of the Universe. In view of the importance attributed to this number by the Greek philosopher the tablets here will receive additional significance. (Hilprecht 1906: 34)

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7 Metrological lists and tables: VAT 1155, VAT 2596 (Meissner 1893: pls. 56–58), unidentified (Scheil 1902: 49–54). Compilations of mathematical problems: BM 85194, BM 85210 (King 1900: pls. 8–15; Neugebauer 1935–37: I 142–193, 219–233, II pls. 5–6, 9). Multiplication tables: Ist Si 289 (×25) (Scheil 1902: 132; Neugebauer 1935–37: I 37 no. 13), BM 92703 = K 8527 (×45) (Bezold 1889–99: 935; Neugebauer 1935–37: I 36 no. 2). Table of squares, inverse squares, and inverse cubes: BM 92698 rev. I–III (Rawlinson *et al.* 1861–84: IV 37; Neugebauer 1935–37: I 69 no. 23). Table of squares only: BM 40107 (Rawlinson *et al.* 1861–84: IV 37; Neugebauer 1935–37: I 68 no. 4). Tables of inverse squares only: BM 92680 = K 3168 obv. (Neugebauer 1935–37: I 68 no. 13), VAT 253 (Königliche Museen zu Berlin 1889: 65; Neugebauer 1935–37: I 68, no. 17), Ist Si 639 (Scheil 1902: 48; Neugebauer 1935–37: I 68 no. 18). Calculation: Ist Si 428 (Scheil 1902: 48; Neugebauer 1935–37: I 80; Friberg 1987–90: 548 Fig. 5).

Whether or not his conscious aim was to reinforce the claimed existence and importance of the Nippur temple library, contemporary reviewers were indubitably impressed.[8] However, his interpretation held sway for less than a decade, until Scheil (1915) showed the true character of reciprocal tables and debunked their relationship with the 'Platonic number'.

Nevertheless, Hilprecht made several useful and much overlooked contributions to understanding the cultural context of multiplication and reciprocal tables. Most importantly, he catalogued and copied tablets of the sort now called Type II (Civil 1979: 5–7). On the obverse of Type II tablets the left hand column contains a teacher's model table which has been copied on the right by a student. The reverse contains multiple columns of another composition, copied as revision by the same student (Veldhuis 1997: 32–37). In his book Hilprecht not only included Type II tablets with exclusively mathematical and metrological content,[9] but also those which had non-mathematical exercises too.[10] He also listed the numerous orthographic errors in the writings 19-lá-1 and a-rá (Hilprecht 1906: 23) and in his copies drew attention to numerical errors — all of which pointed to a scholastic context for the tables, long neglected by later scholarship (Veldhuis 1997: 57; Robson 2003).

Finally, after a review of the weights and measures including two alternative interpretations of the subscripts on the Neo-Babylonian metrological table CBS 8539 (no. 30), he summarised the mathematical "theorems" that "the Babylonians must have been familiar with":

> 1. The area of a rectangle is equal to the product of its base and altitude. 2. The area of a square is equal to the square of its side. 3. The area of a right triangle is equal to one-half of the product of its base and altitude. 4. The area of a trapezoid is equal to one-half the sum of its bases multiplied by its altitude. And, furthermore, [*depending on which interpretation was correct, either*] (5) the volume of a rectangular parallelepiped is equal to the product of its base and altitude; (6) the volume of a cube is equal to the cube of its edge [*or*] (1) that the circumference of a circles bears a constant ratio to its diameter, and (2) that they were familiar with the approximate value of this ratio (π) … though they may have expressed it less accurately than Archimedes, simply by $\pi = 3$. (Hilprecht 1906: 38)

We prefer nowadays to talk of Old Babylonian "rules" rather than "theorems" (Høyrup 1999) but Hilprecht's conclusions have otherwise stood the test of time.

Plimpton, meanwhile, had not given up on his hunt for ancient mathematical artefacts. On 15 March 1906 he wrote to John Dyneley Prince (1868–1945), Professor of Assyriology at Columbia University:

> Sometime I want very much to get a tablet of the multiplication table, or some of those tablets that have to do with the teaching of arithmetic. Now, you are wandering around

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8 See the reviews collected by Hilprecht (1908: 340–353).
9 No. 20 = CBS 11340: obv. 45 times table, rev. reciprocal table and 50 times table; no. 21 = CBS 11368: obv. 50 times table, rev reciprocal table and 50 times table, repeated.
10 No. 23 = CBS 19760 — not 19790 as published: obv. OB Lu B ii 42–47 (Civil 1969: 175 Source I), rev. 'combined' multiplication tables; no. 24 = CBS 11097: obv. Proto-Aa 212–5 (Civil 1979: 88 Source M), rev. 'combined' multiplication tables; no. 37, no museum number: obv. Proto-Ea 177–85 (Civil 1979: 23 Source Fw), rev. table of capacities; no. 38 = CBS 10207: obv. cf. Ur$_5$-ra XVII Nippur Forerunner (= OB Ur$_5$-ra 5) Section A 19 (Landsberger and Reiner 1970: 121), rev. list of capacities.

among different places, and if you happen to run across one, I wish you would let me know about it, so I can buy it. Sometime I want you to come and see my collection of old arithmetics. (GAP03)

No reply survives. The familiar tone, however, suggests that they already knew each other a little, perhaps through Smith's Columbia connections. Undaunted, though still apparently unsuccessful after more than two years of trying to obtain tablets, Plimpton looked further afield to London: on 3 January 1907 he wrote to Theophilus Pinches, formerly of the British Museum, who was then building up the private collection of Lord Amherst of Hackney (Finkel 1996):

> In talking with Mr. William Hayes Ward of this city he told me that you might put me on the track of getting some of those tablets that were used for the instruction of children in arithmetic, containing, for instance, the multiplication table.[11] Now, I shall be very grateful if you can give me any information as to where I can get tablets of this sort.
> I have a library in which I have illustrated the growth of education from the text-book standpoint. In other words, I have gotten together the tools that have been used to educate children. Of course, I should like to go back to the beginning.
> I take pleasure in sending you a copy of a pamphlet on "Some Landmarks in the History of English Grammars," which Professor Kittredge of Harvard University has just written and which is based on my collection of old English books.[12] (CUN01)

Plimpton uses a much more formal language in this letter, establishing his point of connection, explaining his interest in tablets, and establishing his academic and collecting credibility through enclosure of the pamphlet. Pinches replied on the 19th of the month, thanking Plimpton for the pamphlet and explaining:

> I am sorry to say that I have never found, in any of the numerous collections of Babylonian tablets which have come under my notice, specimens of those used in the instruction of children, except at the British Museum. Of course I may, by chance, come across some, sooner or later, in the hands of the dealers, but that possibility becomes more and more unlikely, as, on account of the stringency of the law against the exportation of antiquities, Babylonian tablets of all kinds seem to get rarer every day. Should I be fortunate enough to meet with anything which Lord Amherst of Hackney does not require in that line, I will let you know, but I am not very hopeful of seeing Babylonian or Assyrian educational tablets in the market.
> I hope to enclose, by next mail, a copy of my <u>Assyriological Gleanings</u>, which contain reproductions of tablets of the class in which you are interested from the originals in the British Museum. There are none referring to arithmetic, however. (CUN02)

The difficulty as Pinches saw it, was not ethical but practical: the antiquities laws did not present a moral obligation not to purchase tablets so much as an obstacle to their acquisition. Plimpton, dogged as ever, replied with a one-line message:

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11 Ward had led the Wolfe Expedition to Babylonia, which in 1885 had reconnoitred the Near East for possible excavations sites for the American Oriental Society and the Archaeological Institute of America. He had bought seals and tablets from Daniel Noorian for Columbia University in the 1890s and was later to buy on behalf of J.P. Morgan's private collection (Mendelsohn 1943: preface; Kuklick 1996: 25–26, 107). It is not clear to me why Ward did not act as Plimpton's agent too.

12 (Kittredge 1906). Plimpton presumably met George Lyman Kittredge, a renowned scholar of Chaucer and Shakespeare, through Ginn & Co, which published his co-authored textbook of English grammar (Gardiner *et al.* 1902).

I should be very grateful to you, if you will put me on the track of some of those tablets. (CUN03)

Pinches appears to have replied simply by sending the pledged pamphlet, for on 25 February Plimpton thanked him for it, adding insouciantly:

I got from Professor Hilprecht a copy of one of the tablets on the multiplication table. If I get over to London this spring, I am going to make it a point to come and see you. (CUN05)

Was that a threat or a promise?

Hilprecht's letter to Plimpton survives at Columbia, dated 21 February 1907:

Enclosed please find the bill of $0.$\underline{25}$ for the cast of multiplication table from the Temple Library of Nippur (the original of which is in the Museum of the University of Penn).[13] It reads

    18×1 18
    times 2 36
    times 3 54
    etc in consecutive order
    till
    times 20 360 and then giving only the "tens"
    times 30 540
    times 40 720
    times 60[x)] 1080
    [x] times 60 1080 is the only similar case known to me, all the other multiplication tables give times 50, and then stop. For further details on this class of tablets consult the book marked blue in enclosed list (a book which appeared only recently).[14]
    As matters look at present, I do not see, how it is possible to promise an original. In the bazaars of Constantinople those agents who sell cuneiform tablets are uneducated Armenians, who do not know cuneiform writing.
    I thank you very much for the pamphlet on 'Landmarks in the History of Engl. Grammars'.[15] (CUN04)

Plimpton, then, had continued to pursue Hilprecht since their extant 1904 correspondence, for the pamphlet was published only in 1906.

Hilprecht's doubts about Plimpton purchasing tablets were more specific than Pinches' of a few days earlier: not that the flow of tablets in general was drying up but rather that the dealers were not knowledgeable enough to identify particular genres amongst their holdings. Like Pinches, he had no principled objection to the private ownership of such artefacts.

In the interest of the cause: the Hilprecht-Smith correspondence, 1907

Just nine days earlier, on 12 February, Plimpton's friend and collaborator, Professor David Eugene Smith, had also written to Hilprecht in a letter which does not survive. Hilprecht replied by hand on the 14th, excitedly and at length:

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13 $0.25 in 1907 would be worth $4.72 in today's prices (EH.net)
14 The tablet is CBS 10221 (Hilprecht 1906: no. 5). The final line of the table is a learner's error for the correct $18 \times 50 = 15\ 00$ (*i.e.*, 900).
15 Kittredge (1906) again.

Your letter of Febr. 12 reached me this morning. I hasten to reply that I saw an account of your mathematical exhibit[16] in some Philad. papers and at once thought: I wonder whether Prof. Smith knows of the mathematical treasures so near to New York. I first of all express to you my satisfaction of (*sic*) being able to contribute in any way (however slight) to your collection. Here then is my proposal:

    1. Kindly accept my book on this class of texts recently published, with my compliments and I feel sure with those of our whole Committee, to which I shall speak about your exhibit at our first meeting. [*added later:* I mail it to-night.]

    2. If you do not find it too unpleasant a task, please read the first 38 pages with all the notes, because the book is written for the Assyriologist and a good deal less interesting to him, is referred to the notes which might interest you. You can take in at a glance to what the notes refer. Read particularly the note on pp. 24 f., try whether you can solve better than I the geometrical progression on p. 28 and read the whole of pp. 29–38, particularly pp. 37–38.

He then took a full page to explain in minute detail how Smith should use the book to select tablets in Philadelphia and Constantinople from which Hilprecht would make casts, adding one postscript upside down in the upper margin of the reverse:

In case you care to announce the volume and its contents in any scientific journal that will reach mathematicians, I shall be of course greatly obliged to you in the interest of the cause.

And another in the left margin of the obverse of the letter:

If you care, I think I could procure you a complete set of the phototype plates I–XV, which generally came out well, and unless [*added later:* the odd pages were] destroyed by the binder, also a set of my autograph plates of plates 1–30, in addition to check.

This extraordinary document is in complete contrast to the distant business letter written to Plimpton just a week later. Here, at last, was a potential academic ally in Hilprecht's war with Peters and American Assyriology, who knew nothing of the accusations made against him and could judge him and his work on their merits without prejudice. He was worth a free copy of *Mathematical, metrological and chronological tablets* — and more.[17]

    In the paragraph numbered 2., Hilprecht drew particular attention to three passages. First, "the note on pp. 24 f." is a collation and reinterpretation of Ist Si 428 — which Huber (1957) finally showed was a student calculation of a square root by factorisation.[18] Second, the "geometrical progression on p. 28" is a transliteration of CBS 10201 (Figure 4), which we now understand as the standard series of doubled-and-halved reciprocal pairs, starting with 2 05 ~ 28 48. Hilprecht particularly needed help with the numbers written to the right of each pair, which did not follow an obvious pattern. Scheil (1916) was later to show that these were the first intermediate results from each reciprocal computation; a fuller analysis was given by Sachs (1947). Finally, "the whole of pp. 29–38, particularly pp. 37–38" was the long and speculative disquisition about the so-called 'Platonic number' 12,960,000 (or 60^4) mentioned above, followed by an attempt to understand the subscript of the first metrological table on CBS 8539 (Hilprecht 1906: no. 30; Powell 1987–90: 469) and the summary of Babylonian "theorems."

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16   "For the benefit of students and teachers of mathematics who may be visiting Columbia University (New York), we have arranged in Teachers College a permanent exhibit of material available for the study of the history of mathematics" (Smith 1907*b*: 375).

17   Smith's copy, signed by Hilprecht, is now held by the Rare Book and Manuscript Library of Columbia University, catalogue number Smith R510.9 H56.

18   Copy in Friberg (1987–90: 548).

Smith responded equally enthusiastically just a few days later, with a six page type-script, the sole survivor of his letters to Hilprecht (DES02). Not surprisingly, he failed to address the particularly difficult problem involved in the interpretation of Ist Si 428, which would only be fully solved decades later with the benefit of further exemplars and a deeper understanding of the sexagesimal place value system. Instead, he focussed on broader historical matters, in particular the possible relationship between Babylonian and Egyptian mathematics,[19] beginning with a discussion of fractions, as attested on the 'division tables'. He was, he told Hilprecht, "particularly interested in cylinders 22 and 25" [Figure 3; Figure 4].[20] Hilprecht's restoration of the first line of the standard reciprocal table as "*IGI*-1-*GAL-BI* 8,640,000 *A-AN*" (*i.e.* igi-1-ḡál-bi 40-àm) (1906: 25) especially concerned him:

> As you well know the Egyptians and early Greeks and many other ancient peoples dealt only with unit fractions, or almost wholly so. In the case of the Egyptian, as you well know, they had only one symbol for fractions save the unit fraction. This was their first symbol and was for two-thirds [*Egyptian symbol*]. I am therefore wondering whether line one does not refer, as you suggest on page 25, to some abbreviated expression for the first fraction symbol. This in the hieroglyphics was the only special symbol save that for one half, name-ly [*Egyptian symbol*]. Now I fancy there was such connection between the ancient culture of Egypt and that of Babylon to make a custom of this kind in one country at least some-what known in the other. It would therefore look very much as if the unit scheme of frac-tion of the Egyptians had come from the same source as this scheme of the Babylonians.

Smith's intuition was right: exemplars more complete than those Hilprecht had access to have shown that the cuneiform symbol for $^2/_3$ is used in the first line of standard Old Babylonian reciprocal tables, typically in the expression "1-da $^2/_3$-bi 40-àm" (*e.g.*, Neuge-bauer and Sachs 1945: 12). However, there is no evidence for a common source for Egyptian and Babylonian unit fractions.

He then went on to make some hand-written suggestions about unit fractions and CBS 10201 [Figure 4], but frustratingly these were not transferred to the extant carbon copy. However, on the basis of close similarities between this letter and his later review of Hilprecht's book (Smith 1907*a*), we can fairly confidently assume a parallel. In the latter Smith argues that the mystery left hand number in entries such as

2 05　　　　12
28 48

(CBS 10201: obv 1–2) may hint at the use of continued fractions, "a form met not only among the Egyptians but among the early Greeks and other peoples about the Medi-terranean," namely;

$$\frac{1}{60^2} \cdot 125 = \frac{1}{30} + \frac{1}{720} ,$$

where 125 is the decimal writing of 2 05 and 720 is for 12 00 (Smith 1907*a*: 396). Following Sachs (1947), who examined a much larger corpus of related texts, we would now express the relationship between the 2 05, 12 and 28 48 as:

19　Eisenlohr's edition of the Rhind mathematical papyrus had appeared in 1877 (Eisenlohr 1877), Smith and Plimpton both owned copies.
20　It is not at all clear why Smith consistently referred to tablets as "cylinders," as none of those in Hilprecht's book were cylindrical prisms, and neither were any of the tablets that Smith was eventually to acquire.
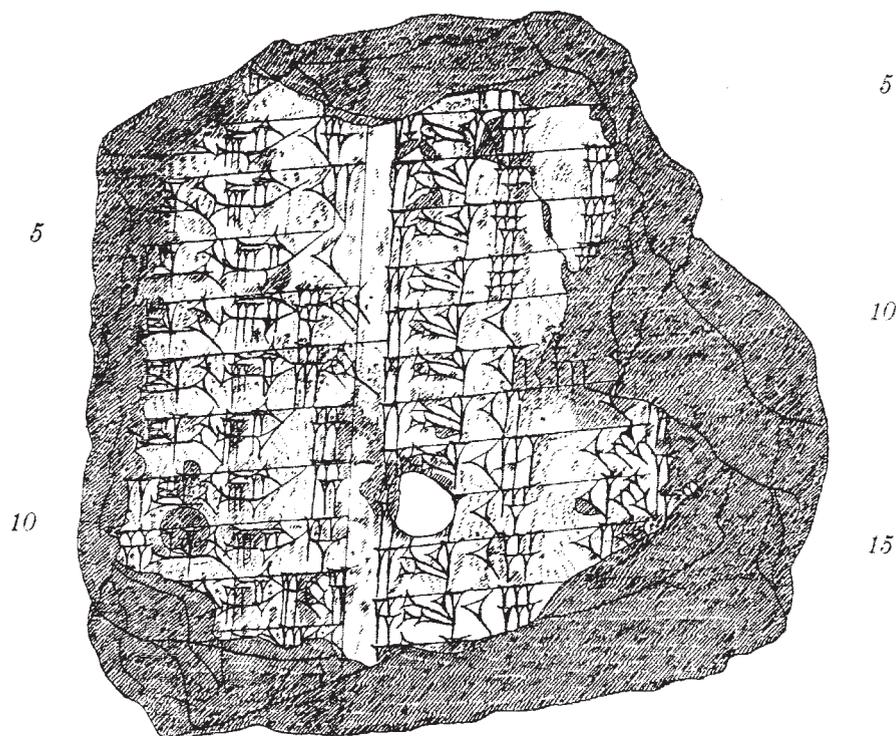
Col. I. Col. II. Col. III.

5

5

10

10

15

Figure 3: CBS 11902 (Hilprecht 1906: no. 22)

Obverse. Reverse.

10

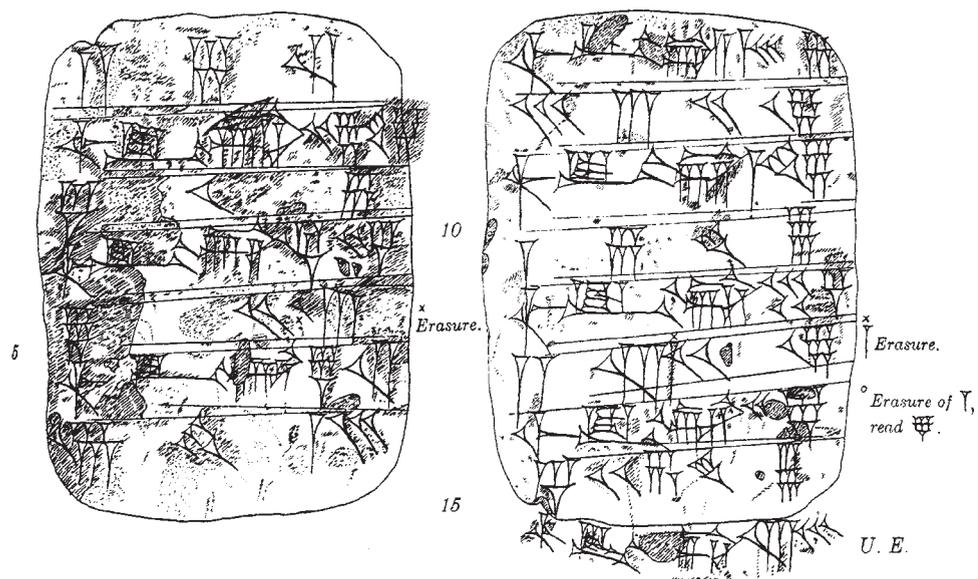Erasure.

Erasure.

Erasure of 𒑐,
read 𒌇.

5

15

U. E.

Figure 4: CBS 10201 (Hilprecht 1906: no. 25)

$$\frac{1}{2\ 05} = \frac{1}{2\ 00+5} = \frac{1}{5} \cdot \left(\frac{1}{1+2\ 00 \cdot \frac{1}{5}}\right) = 0;28\ 48.$$

That is, we understand the algorithm for finding reciprocals as essentially multiplicative rather than additive.[21] Nevertheless, Smith was absolutely right to identify 12 as $^1/_{720}$ (equivalent to $^1/_5$): we now know that the first step of the reciprocal procedure is to split off from the end of the number given a number whose reciprocal is in the standard table — in this case 5 = $^1/_{12}$ — and to record that value, as seen on CBS 10201. Other tablets also record the results of the following intermediate steps (*e.g.*, CBS 1215, Sachs 1947).

Smith was also intrigued by possible terminological similarities between Babylonian and Egyptian unit fractions:

> Another thing that struck me as very interesting was that the symbol for denominator was the word IGI-GAL which means "having an eye."[22] It seems a pity that we cannot make some connection between that and the Egyptian symbol for fraction, namely [*Egyptian symbol*]. This in Egyptian is <u>ro</u>, meaning, as you know, a mouth. I however, wondering whether the original fraction may not have been an eye [*Egyptian symbol*] instead of a mouth [*Egyptian symbol*]. Of course this is very likely a mere fanciful guess like lots of the unscientific things we run across in the history of mathematics. I wish I might be able to get at some of the earliest hieroglyphic symbols in which fractions enter and see if there is any chance for such an hypothesis.

Smith was describing here what later became known as the 'Horus eye fractions' (Möller 1911), which would have made the parallel between the Egyptian and Babylonian unit fractions very striking indeed. However, we now understand it to be false on two counts: the cuneiform evidence is so meagre and ambiguous that "the literal meaning of the expression [igi-*n*-ḡál] is still unclear" (Høyrup 1990: 53), while "whatever the later Egyptian reinterpretation of the original hieratic signs may have been, the third millennium [evidence] leave[s] no doubt that the eye of Horus had nothing to do with the origins of the original hieratic signs" for fractions (Ritter 2000: 117).

Smith continued to make comparisons with more familiar ancient mathematical cultures:

> I was also very glad to find the reference to the subtractive principle on page 23.[23] I had never happened to meet this in my very cursory reading on the cuneiform inscriptions. We generally, of course, can attribute the principle to the Romans since it appears in their symbols and also in their notation. I wonder if the Babylonian system ever wrote 18 on the subtractive plan.
>   As I looked over pages 35 to 38 I thought I recognized some relation to the Egyptian [metrological] system. I have not, however, been able to find anything definite upon this subject and of course, if it existed Eisenlohr would have mentioned it in his work upon Babylonian measures.[24] For example it occurred to me, as I glanced at the pages the first time that there might be such correspondence as the following [*2 hand-written lines not copied onto the extant carbon copy*]. This, however, is purely fanciful.[25]

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21 Following Høyrup (1990), it is now considered conceptually more appropriate to represent the relationship visually: see Robson (2003).
22 Hilprecht (1906: 22).
23 Namely writings like 20-lá-1 for 19.
24 Eisenlohr and Scheil (1898).
25 The passage cannot be restored as this paragraph did not make it into Smith's review.

With respect to the arrangement of the multiplication tables mentioned on page 20, it occurs to me that we have similar [*added by hand*: rather modern] cases, namely in the late mediaeval manuscripts of the Italian arithmeticians.[26] The separations of the numbers by intervals is very likely owing entirely to their system of measures. They gave in the tables the numbers which they used in their weights and other measures. Is it not possible that some similar explanation obtains for these cylinder symbols?

…

I am also very much interested in the conclusions in the middle of page 38.[27] I have not the slightest doubt that you will find in due time that the Babylonians know the use of pi quite as closely as Ahmes knew it.[28] I judge this because their numerical system is as advanced. They certainly must have known it as closely as the Biblical value 3.

Smith offered to review Hilprecht's book in the *Bulletin of the Mathematical Society* (of which he was an editor), taking up the offer of photographic plates and requesting the original copy of no. 25 (CBS 10201) to reproduce there. He was also delighted by Hilprecht's offer of casts, hesitantly choosing twenty-two: [29]

I hardly know what to say. I do not wish to ask for an unreasonable number particularly as my students are not Assyriologists. I really feel, however, that we could make legitimate and permanent use of a considerable number. ...

With respect to those in Constantinople I shall be very glad to pay, not only for them, but for reproducing any material which has a bearing upon the history of mathematics. In particular it is not impossible that there may be astrolabes or old measures which could be reproduced at a reasonable price in electrotype, or if not reproduced in that way could be photographed. Any assistance which you might give me in that line would be highly appreciated. I am hoping myself to be in Constantinople a year from this month [*i.e., February 1908*]. If you feel that there is any material that I should have attention called to particularly[,] possibly you might feel like giving me a letter to the authorities there.

At the end of the six page letter, Smith admitted his intense intellectual excitement at Hilprecht's material:

I must confess that if I were not so deeply plunged in my own work here I fear that you might see me in Philadelphia as a student of Babylonian mathematics, or at least as a rather constant caller at the museum.

If the prescient comments in this letter are anything to go by, the combination of Hilprecht and Smith could perhaps have rivalled the later partnership of Neugebauer and Sachs. But, promising as it appeared, this correspondence was not to prove a meeting of minds: Hilprecht was far too pre-occupied by the row still raging around him and was predisposed to defensiveness. He wrote to Smith at least three times in the following months (DES03, DES04, DES05), but only the first and longest letter, dated 20 March 1907, addressed the issues that Smith had raised:

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26 Smith is referring to the fact that the 'combined' series of multiplication tables do not include every possible integer within the range they cover.
27 That is, the "theorems" that "the Babylonians must have been familiar with."
28 That is, the scribe of the Rhind papyrus.
29 Hilprecht (1903: nos. 2–5, 7, 9–12, 14, 17, 18, 20–22, 24, 25, 25a, 26–30, 33–35, 38) — ten 'single' multiplication tables, six 'combined', a calculation, the set of problems, a table of squares, two tables of inverse squares, six metrological lists and tables. Only nine are reasonably complete, and he did not choose all the complete tablets in the book. The surviving casts are now in the possession of Columbia University's Rare Book and Manuscript Library.

Kindly pardon me for not answering your 2 letters of Febr 18 before. The only reason for my long silence is my poor health. I had a severe nervous collapse end of December which forced me to quit work for over 4 weeks at the University. Soon after I had resumed my duties, both my eyes and teeth showed the result of the previous collapse. Ever since I have been in the hands of the oculist and dentist. I spent 2 hours with them again to-day, and while I am writing, I am in a wretched physical condition. But after your letter of yesterday, which I received this morning, I shall not delay my answer any longer, especially as I look for little sleep to-night, owing to a very painful abscess. Let me take the letters up according to certain points contained in them. (DES03)

His first substantive point was this:

2. You are interested in the first line of the restoration of No. 22. My restoration IGI-<u>1</u>-GAL-BI (p. 22) is based upon the fact that the abbreviated form (i.e. the mere number 1 without IGI-GAL-BI [which may be omitted altogether or written only <u>IGI</u>, cf. p. 22]) is preserved <u>twice</u>. Cf. No. 20, Reverse, Col. II, and No. 24, Rev, Col. VI, line 1. In each case the cuneiform sign clearly written, is [*a vertical wedge*] which can only mean 1 or 60 etc (vf. p. 26). The following fractions may also be expressed by special signs in Babylonian texts of the same 2 periods as those published in my recent volume (*c.* 1350 B.C. and *c.* 2400–2200 B.C.), namely $^1/_2$, $^2/_3$, $^1/_3$, $^5/_6$.**[30]** It is absolutely certain, a) that none of these fraction signs was employed in the text in question b) that the text had [*a vertical wedge*], which never means a fraction in cuneiform documents thus far. What the secret is, I do not know. I hope my later investigation on unpublished material with clear up the matter, unless what I would prefer 12,960,000 times (not to say 1000 times) <u>you</u> would solve the matter as a mathematician with an infinitely better knowledge of such things than I possess.

We know now that Hilprecht's vigorously stated arguments for restoring the [igi-1-ǧál-bi 40-àm] at the start of the reciprocal table do not hold water, for they are based on tersely formatted tables of the form n $^1/n$ not the verbosely formatted igi-n-ǧál-bi $^1/n$. As he predicted, however, new material would soon settle the matter (Scheil 1915). Hilprecht continued in the same vein, unwilling to concede that anything he had written might be open to improvement and citing eminent German scholars in his support:

3. As to the Egyptian symbol for fraction namely [*Egyptian symbol*] "<u>ro</u>," 'mouth', I would leave it as it is, notwithstanding the Sumerian IGI-GAL 'having an <u>eye</u>' = denominator, for both the Semitic Babylonian and the Hebrew use pî, "mouth" also for "fraction" like the Egyptian. Cf. the Babylonian word for $^2/_3$,**[31]** which is shînipu evidently = <u>šinâ</u> 2 + <u>pû</u> "mouth," "fraction," conforming to the Hebrew <u>pî sh'napim</u>,**[32]** = 2 fractions = $^2/_3$.
…

   5. As to the separations of the numbers by intervals in the arrangements of the multiplication tables, I am sorry to say that the principle (using only the numbers employed in their weights and other measures) does not hold good in the Babylonian arrangement. You will be interested to know that the most careful Assyriologist of Europe (notorious for his <u>great care</u>) Prof. Zimmern of Leipzig [*added later:* cf. my book, p. 35, note 1] (who has essentially contributed to Babylonian metrology and loves mathematics, which at first he wanted to study) has accepted (<u>without a single exception</u>) my whole theory with all its details (cf. pp. 34) in his very flattering review of my book: "Mathematische Wissenschaften," Berlin 8 Febr. 1907. (Scientific Section of the "National Zeitung" of Berlin). Prof. Hömmel of Munich and Prof. Winckler of Berlin, and nearly all the leading

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30   Here Hilprecht has written the cuneiform symbols too.
31   Accompanied by the cuneiform sign for $^2/_3$.
32   Also written in Hebrew characters.

Assyriological authorities of Europe in these matters have written to me in the same way and from what I hear, about 20–30 different reviews in Mathematical, Astronomical, Classical, Anthropological, Historical + Semitistic scientific journals will appear. I hope also Prof. Cantor of Halle will review it in January.[33]

After four pages of such bluster, however, Hilprecht had the good grace to "thank you most heartily for your kindness to review the book ... For the interest + help of specialists like yourself is exactly what I and the cause of science require." He also promised all the casts and photographic plates that Smith had asked for and admitted that "your explanation of No. 25 is very novel and interests me <u>exceedingly</u>." Reproductions of CBS 10201 from the original were impossible, however, for

there are no woodcuts. All the 30 plates were drawn by my own hand, the photography on stone and the stones destroyed last fall. Every illustration therefore you decide to have inserted, you should have to reproduce from my book directly as half-tone or cut in New York.

   Unfortunately the Imperial Ottoman Museum has written direct to the Provost of our University, asking myself for a leave of absence for me, as they desire the definite organisation of the entire Assyriol section under my charge. I am thus forced to leave on March 26 by "Kaiser Wilhelm" from Hoboken for Bremen — much earlier than I had hoped. And of course I shall give you all the necessary help next year when you go yourself to Constantinople (with introductory notes). But before this takes place, I sincerely hope you will give me the pleasure of your visit in Philadelphia after my return (end of October).

After a further page of notes about the date of the supposed Nippur temple library, he finally drew the long letter to a close:

May this suffice tonight, I suffer badly. It is past 12 o'clock (midnight).

Smith's very favourable review, which follows closely the ideas expressed in his first letter (DES02), came out just three months later, in the May issue of the *Bulletin of the AMS* (Smith 1907*a*).[34] He immediately forwarded offprints to Hilprecht in Constantinople, who replied at the end of the month. Hilprecht was keen to assist Smith despite being much preoccupied with his continuing professional crisis. Over a year earlier, on 18 April 1906, "sixteen American Orientalists" headed by Charles Lanman of Harvard, had written to Hilprecht requesting "a full and frank statement of the facts, so far as they bear upon your activity at Nippur and your publications relating to the same" (Hilprecht 1908: 321). This letter was still weighing on his mind:

Yesterday I received your 4 copies of your kind notice of my mathematical texts. I heartily appreciate your kindness and especially also what you say on p. 393 on the [*illegible*] criticism I had to stand from Jackson, etc as to the temple library.[35] Prof. Cantor of Heidelberg wrote to me that he also came to the conclusions that the Babylonians knew π = <u>3</u> from other considerations than mine, he felt sorry he could not use my results in his new edition of the History of Math., the first volume of which was just published before my volume

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33   Hilprecht published extracts from the more favourable reviews in his later book on the controversy (1908).
34   The original is in the D. E. Smith Professional collection of the Rare Book and Manuscript Library of Columbia University, Box 88: "The mathematical tablets of Nippur."
35   The Sanskritist A. V. Williams Jackson of Columbia University was a signatory to the letter, along with Plimpton's acquaintances Richard Gottheil (also of Columbia) and William Hayes Ward. Presumably Hilprecht mentioned Jackson as someone known to Smith at Columbia.

appeared, but he kindly [*illegible*] a review of the book. After all the suffering + unjust attacks through which I had to pass during the past years, I feel so grateful for the kindness with which my first volume on the temple library has been received everywhere, yourself [*illegible*] included.

Meanwhile I have had a long talk with Halil [Edhem] Bey, Director of the Imperial Ottoman Museum, here on you + your work. He will support you heartily, in all he can. The cuneiform tablets leave to me. I have ordered casts already for you of all you will require in my opinion, and will take them with me for you to America, ready for you when you return there. There are several fine astrolabes and other mathematical things of interest for you in the Ancient Turkish section of the Museum. Halil Bey has promised me, he will give you either casts or photographs of those too. Just show him my introductory letter, in case things should get mixed up again in his mind after I left here. I shall speak about you + his promise once more before I leave. You will be sure to find a hearty welcome with him. I am only sorry, I shall not be here probably when you come. And I shall give you a hearty welcome in Philadelphia + have everything ready for you there. (DES05)

Smith received the Philadelphia casts on 19 September 1907 (HVH04) and must have immediately added them to his historical display at Teachers College. The exhibition label is still extant at Columbia. It reads:

Collection of casts of Babylonian Cylinders in the Museum of the University of Pennsylvania and described in Hilprecht's work on Babylonian mathematics. They form the most noteworthy contribution to the history of very ancient mathematics extant. Presented by Professor Hilprecht (CUN06).

However, Smith's announcement of the exhibition in that year's *Bibliotheca Mathematica* declared that it "include(d) a Babylonian cylinder with cuneiform numerals (and) reproductions of various other cylinders" (Smith 1907*b*: 377). The reproductions we can account for as casts, but what might the original tablet have been? There is nothing else in either Smith's or Plimpton's *Nachlass* to account for it.

That manuscript of Archimedes: Plimpton's letters, 1908

In July 1907 an article appeared on the front page of the *New York Times* which was to distract Plimpton from the tablet hunt for a while:[36]

BIG LITERARY FIND IN CONSTANTINOPLE
Savant Discovers Books by Archimedes, Copied 900 A. D.

The 'savant' was the Danish classics scholar Johan Ludvig Heiberg, who had identified a unique source for the works of Archimedes in the Metochion Library in Constantinople. The book was a palimpsest: a tenth century compilation of Archimedes' works under a late twelfth century *euchologion*, or Christian prayer book. It is now known that the palimpsest

includes the only copy of the treatise *Method of Mechanical Theorems*, in which Archimedes explained how he drew upon mechanical means to elucidate his mathematical theorems. It is also the only source in the original Greek for the treatise *On Floating Bodies*, in which Archimedes explores the physics of flotation and explains the formal proof for the principle of specific gravity. (Noel *et al.* 1999)

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36   *New York Times*, 16 July 1907, page 1.

Plimpton, not surprisingly, was hugely excited. Smith was due to go on an Old World book-buying mission with the aim of completing Plimpton's collection as far was practicable before the publication of *Rara Arithmetica*. They had already planned a stop in Constantinople, for which Smith had solicited a letter of introduction from Hilprecht to Halil Edhem (DES05). Plimpton, "a firm believer in education for women," also had contacts in Constantinople, through his charitable work as a member of the Board of Directors of Constantinople Woman's College (Patrick 1934: 120; Plimpton 1993: 15).[37] He thus wrote at least twice to Isabel Dodd, the college's professor of art and archaeology, in late 1907 or early 1908, asking for help in tracking the manuscript down:

> I am interested in that manuscript of Archimedes, and I should be very glad to know what has become of it, and whether it could not be bought, and if so, at what price. I imagine if it is in a monastery, they would rather have the money than the manuscript, especially after the novelty has worn off. (GAP06)

This second letter must have crossed in the post with her reply, dated 8 February 1908:

> I inquired of our Greek Professor here in regard to the manuscript, and he asked at the Syllogos and said that they seemed very noncommittal. He did not really find out anything about the manuscript, but he said decidedly that, as it was owned by the Monastery, there would be no hope of their selling it to any one at any price.
>
> Then I wrote to the Swedish Embassy here and received their answer:- "Professor Heiberg discovered the manuscript at Phanar (on the Golden Horn) where it is guarded very carefully. He was, however, allowed to see it and copy from it, and some reproductions have been made from it by the Swedish photographer Berggren. He, however, is not allowed to print copies of the photographs without the permission of Professor Heiberg.
>
> Of course, there is no question of the manuscript being for sale; but as the American gentleman is interested in it, he might like to write to learn more of it, which he could do by writing to Professor Heiberg, whose address I enclose." (GAP05)

Dodd ended by offering her help in acquiring the necessary permits for viewing the Archimedes manuscript, should Plimpton ever come to visit. He thanked her for the information on 24 February (GAP07), writing to Heiberg the very same day:

> I should be glad to know something about the old manuscript of Archimedes, which you discovered in one of the monasteries of Constantinople. What is the character of the manuscript, and does it contain anything new in the subject that is not already known? Has the monastery put a price on it for which they would sell the same? Any information you can give me regarding it will be greatly appreciated. (GAP08)

Heiberg's reply, if there was one, does not survive.[38] Smith, meanwhile, was already in Constantinople buying books and manuscripts on Plimpton's behalf. While Smith pur-

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37   Plimpton, in a letter of February 1906 to Caroline Borden, trustee of Constantinople Woman's College, congratulating her on recent work, intriguingly forwarded a letter from "Mrs Peters, the wife of Dr. Peters who has spent so much time at Nippur and Nineveh" (GAP04). What might that letter have contained?
         Photographs of Dodd and Borden appear in the history of the college written by its first principal, Mary Mills Patrick (1934: opp. p. 148).
38   His first account of the palimpsest is given in Heiberg and Zeuthner (1907); see also Heiberg (1910–15). A new edition by Reviel Netz is in preparation (see Netz 2000).

chased a good deal of mathematics in Arabic through Halil Edhem's agency,[39] he does not seem to have had any success at all with the Archimedes palimpsest. At the end of February Smith moved on to Rome for a few months, where Plimpton inquired of him what, if any, luck he had had in locating it (GAP11); Smith's reply of 21 May failed to mention the manuscript at all (GAP12), and that was the end of that. The manuscript finally resurfaced at a Christie's auction in New York on 29 October 1998, where it transpired that it had been in private hands in Paris since at least the 1930s. It sold for $2,000,000 to an anonymous collector. Plimpton's instinct that the monastery "would rather have the money than the manuscript" might have been right after all.

A good little talk together: the Hilprecht-Smith correspondence, 1908–09

Did Smith purchase cuneiform tablets in Istanbul? If he did, no documentation survives. The tablet trail goes cold on us for several years. Meanwhile, though, Hilprecht continued to cultivate Smith as virtually the only academic in America who supported his cause. Although a hearing at the University of Philadelphia had exonerated him in 1905 (Kuklick 1996: 133), the rumours would not die down. Eventually Lanman and "the sixteen" published their letter in the *American Journal of Semitic Languages and Literatures* in October 1907. Hilprecht decided to clear his name by assembling documentation to do with the case, in the hope that disinterested scholars would be convinced by the weight of evidence on his side (Hilprecht 1908). In an appendix he added as many positive reviews as he could find of his book on the Nippur mathematical tablets (1906); Smith's had pride of place (Smith 1907*a*; Hilprecht 1908: 340–353). Four letters from Hilprecht to Smith over the period July 1908 to April 1909 survive (DES06, DES07, DES10, DES11); they make little mention of matters mathematical but show Hilprecht to be almost entirely wrapped up in his own affairs and continuing hypochondria. Publication had not put his mind at rest, as this lengthy letter written from his home in Germany vividly illustrates:

> Your letter of February 26, reached me in Philadelphia at a time when after three attacks of "grippe" and with a finger hurt by hydro-chloric acid which did not heal before June, I was using the bodily strength left to me to finish my controversy book, which immediately after its publication I sent to your London address. It was shipped in the second half of April and, I trust, reached you. Yesterday I sent you a pamphlet published by the Medical Professor Dr McClellan and the well known Assyriologist Dr Radau.[40] Matters took a decidedly favourable turn, as even as it became known that I meant to publish all the documents "[*illegible*] et cetera" and the whole mass of material constituting the basis of the decision of the U. of Pa.'s Court of Enquiry of 1905. My adversaries evidently feared publicity. I was visited by a number of scholars, including 3 of the 16 Orientalists who recognized that they had gone too far, requesting me not to publish anything, and even intimating, (yea writing out in so and so many words what I should say) that if I only made a trifling concession, the adversaries would keep silent. As I could not make those conces-

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39 (GAP09; GAP10; DES08; DES09). Smith had reserved for Plimpton's purchase six Arabic manuscripts at $180 "in the library of a savant who is known to the learned Dr Halil Edhem Bey of the Imperial Museum, who has been doing all he can for me here" (GAP09).

40 Hilprecht's research student and sole academic ally in Philadelphia (Kuklick 1996: 139). I have been unable to identify the pamphlet.

sions, I published the book and sent a copy to each of the 16 Orientalists through their act-
ing Secretary in connection with the Oriental Meeting at Boston towards the end of April.
The Committee of 16 dissolved and informed me in letter before, that they hoped, matters
would now stop. Prof. Robert Francis Harper of Chicago, one of the 16 but also a friend
of mine, wrote to me a few days ago literally: "There was more fighting at these meetings
than ever before. The conservative peace party won every point. I shall give you the histo-
ry of the three days in Cambridge sometime when I see you. Taking everything into con-
sideration I think that the letter sent to you was a virtual acquittal on all points. I know that
all of your confreres, with perhaps the exception of two or three, are more than ready to
wipe the bickerings of the last two or three years off the slate and to meet you more than
half way with a distinctly friendly feeling."

As you will see from Dr McClellan's pamphlet, the leading Philad. families, the old aris-
tocracy of the city, including half a dozen prominent millionaires who have the confidence
of the entire city for what they have done for the welfare of Philadelphia in previous years,
took matters into their own hands and demanded that these machinations which make
scientific work for me impossible, must stop. European Assyriologists (including 3 profes-
sors of the Univ. of Leipzig who published a signed article in the "Liter. Centralblatt" in
February, acknowledged the entire justice of the verdict reached by the Council of Inquiry
of 1905, and stating frankly that this running down of a scholar was a disgrace to American
scholarship) protested publicly. In short, unless I am entirely deceived, tranquillity has
finally been restored. But at what expense of strength and health on the part of my wife and
myself! We both were nearly exhausted when we left America at the beginning of May. She
is in poor health even now, and whenever I study more than one hour, my nerves begin to
tremble, and my arms get so weary, starting at the nerve-centre below the head, that I can-
not lift a book without supporting the lifting arm with the other hand. I hope peace has
not been restored too late.

This brief review of what has happened, given you entirely confidentially, as you took
such a warm interest in my person and work, will explain to you, why I left your good let-
ter so long unanswered: I could do almost nothing after I got out of the firing line.

I am glad I could be of some little assistance to you in Constantinople, and more than
glad, that you had such a good time and real success wherever you went. Your cylinders
(mathematical) and mathematical texts from originals in Constantinople are safely stored
with me in Philadelphia. As soon as I come back they will be sent to you with those casts
made from our Philad. originals, unless the latter were sent to your office during your
absence.

I also will discuss with you all you want to know about the original position of the num-
bers — or |.[41] You must come over and spend the night in our house (807 Spruce Str.) so
that you can see the Museum and tell me more of your trip in the evening. I hope that my
controversy book has met with your approval.[42] I have tried to cover every point, but of
course should like to hear, how it strikes you, a fair-minded objective outsider.

We shall be here at our place till about Aug. 7, then go to Beyreut and make a trip in
our automobile to give Mrs Hilprecht (who is lame and fell very unfortunately 4 weeks ago)
a much needed change. If you are anywhere near this part of the country, send a telegram
upon receipt of this letter and spend a night with us. Both Mrs. Hilprecht + I would give
you a hearty welcome. (DES06)

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41 Presumably a question about the orientation of cuneiform numerals, put to Hilprecht in a let-
ter that does not survive.
42 Interestingly, it does not survive in the Smith collection at Columbia, although all Hilprecht's
other documented gifts to Smith do.

Hilprecht wrote again to Smith in October 1908, enclosing the casts of Constantinople tablets that Smith had requested back in February 1907 (DES07):[43]

> Excuse red ink — the only thing I have at present. We arrived Oct 20 late (the night) at Philad. As we had no time yet to do anything but unpack and try to get rid of more than 30 reporters who pester us owing to the presence of Princess Feinburg-Rüdiger [?], who will spend winter with us, I have not been able to buy black ink yet. The old bottle has dried up during summer. (DES07)

Smith, meanwhile, was on the publication committee for Hilprecht's Festschrift — one of only two US members — to be presented to the recipient on 28 July 1909, his fiftieth birthday, but which he actually received in April 1910 (Kuklick 1996: 138).[44] The only mathematical contribution to the volume was, interestingly enough, by another of Plimpton's erstwhile correspondents. Theophilus Pinches gave a description of Bu 91–5–9, 263 = BM 80150, which contains a long extract from the standard Old Babylonian series of multiplication tables from 50 to 9, headed by a reciprocal table and rounded off by a table of halved-and-doubled reciprocal pairs very similar to CBS 10201.[45] The article was based on "a rough transcription" and draft copies of "the more doubtful portions" he had made "about 10 years ago" when he was still working for the British Museum but which he could now interpret "in the light of Prof. Hilprecht's discoveries" (Pinches 1909: 71). Indeed, the whole text comprised genres of tables published first in Hilprecht (1906).

Smith wrote twice on March 22 and again on April 5; the letters do not survive (DES10). The last piece of the correspondence dates to 13 April 1909:

> Pardon please my delay in answering your kind note of April 8. I have received leave of absence from my work at the University here, so that we shall be in New York on April 23ᵈ; and both Mrs. Hilprecht and I will really be most happy and grateful, if you & Mrs. Smith will give us the pleasure of dining with us at the Holland House that evening at 7 p.m. We long to make your personal acquaintance and have a good little talk together.
>
> Mrs. Hilprecht asks me particularly to write you, how much she appreciates Mrs. Smith's and your kind thoughtfulness. (DES11)

Presumably the dinner party went ahead as planned; but that is the last we hear of Smith and Hilprecht's correspondence, and one wonders whether a face to face meeting did not deter Smith from pursuing the relationship further. The fact that Hilprecht presented Smith with a copy of his next work on the Nippur tablets (Hilprecht 1910) suggests that coolness was on Smith's side. Hilprecht's new book met with renewed hostility and criti-

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43   The casts (Hilprecht 1906: nos. 10, 12, 14, 18) survive at Columbia along with individual labels and a general notice, presumably written for the ongoing Teachers College exhibition on history of mathematics:
     COLLECTION OF CASTS OF BABYLONIAN CYLINDERS IN THE IMPERIAL OTTOMAN MUSEUM AT CONSTANTINOPLE. DISCOVERED BY PROFESSOR HILPRECHT AT NIPPUR. THEY ARE ALL MATHEMATICAL AND OF THE PERIOD OF THOSE DESCRIBED IN HILPRECHT'S WORK. PRESENTED BY HIS EXCELLENCY HALIL EDHEM BEY AT THE REQUEST OF PROFESSOR HILPRECHT. (CUN07)
44   Hilprecht (1909). Smith's signature is reproduced on page V, sixth from the top, on the right. He is also list on p IX, under "Members of the Committee on Publication." Smith's copy of the *Hilprecht Anniversary Volume* is held at Columbia University's Rare Book and Manuscript Library, catalogue number Smith 510.9 H.56.
45   Subsequently re-published by Neugebauer (1935–37: I 11 no. 12, 23 no. 3, 49–50 no. 105) and Nissen, Damerow and Englund (1993: fig. 124).

cism (*e.g.,* Prince and Vanderburgh 1910; Barton 1911) and Hilprecht finally resigned from the University of Pennsylvania at the end of 1910 (Kuklick 1996: 138).

Tablets of this class are extremely rare: Plimpton's letters, 1915

Meanwhile, Plimpton's Near Eastern contacts continued to grow. In late 1912 he wrote to James Henry Breasted, Director of the Oriental Institute in Chicago, asking for advice on the Egyptian holiday plans of a friend of his, and enclosing, as usual, a pamphlet (GAP13).[46] In 1920 Breasted stayed at the Plimpton's home in New York (GAP14). By 1914, the year in which he became chairman of Ginn & Co., Plimpton had enlisted the help of Richard J. H. Gottheil (1862–1936), Professor of Semitics at Columbia University and erstwhile detractor of Hilprecht, in locating tablets for him. On 29 April 1915, the dealer R. D. Messayeh wrote to Plimpton from his office at 63 East 125th Street, New York:

> About a year ago Prof. Richard Gottheil, of Columbia University, asked me if I could furnish you with a few tablets (Babylonian) used as school text-books. I have since endeavoured to get you some and as tablets of this class are extremely rare, I regret to say that I have not been ably (*sic*) to comply with his request earlier.
> I am to-day sending you a package containig (*sic*) five gramatical (*sic*) tablets. They have been selected from a large collection by Prof. Albert T. Clay, of Yale University. If you wish to retain them, you can remit \$40.00.[47] If not kindly return them. I have included two cones from Warka (Biblical Erech) as they are interesting. (CUN08)

Clay, Hilprecht's former student and research assistant, now held a professorship at Yale which had been endowed by J. P. Morgan, whose tablet collection he was later to publish. Clay was currently building up the Yale Babylonian Collection of cuneiform tablets, "help[ing to] finance his purchases by buying large quantities of tablets, then reselling those of less interest to him" (Foster 1999*a*) — as was the case here.

Plimpton tried to get his old contact John Dyneley Prince to look over the tablets, apparently without success, and then wrote back to Messayeh on 1 July, saying that he would take some but not all (CUN09). Presumably he did not think the (non-educational) cones as interesting as Messayeh did. But Messayeh very politely declined to split the lot (CUN10), and it appears that Plimpton eventually did buy the whole group. At least, the two cones are identifiable in the Columbia collection as nos. 279 and 280 (see Appendix). The five others, if they indeed were school tablets, may have included nos. 266 or 267, 316, 318, and 320. Thus Plimpton acquired his first cuneiform tablets.

Undoubtedly mathematical: the Banks-Plimpton correspondence, 1922–23

Once again Plimpton's records fall silent for several years on the subject of cuneiform tablets. We pick up the story again in the early 1920s, nearly twenty years after Plimpton's first correspondence with Hilprecht. Back then, as Hilprecht had been drowning under the first wave of critical reaction to his interpretation of the Nippur dig, a rival American expedition from the University of Chicago was just opening excavations at the neighbouring

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46   The pamphlet, on 'Shakespeare's boyhood', was eventually published as Plimpton (1933).
47   Equivalent to about \$700 in today's money (EH.net).

Babylonian site of Bismya, ancient Adab, only 20 miles away from Nippur. Its leader was Edgar J. Banks (1866–1945), another former Delitzsch student, who resigned at the start of the second season in 1905 under suspicion of stealing antiquities (Banks 1912). The incident has never been satisfactorily explained. Banks returned to the Middle East in 1912, where, according to his *curriculum vitae*, he "climbed to [the] summit of Mt. Ararat, 17,212 ft., Aug. 20 [and] crossed the Arabian desert by camel … on an exploring exp[e]d[itio]n" (CUN25), the first American to do so. During that same year he acquired a large number of cuneiform tablets in Baghdad — perhaps as many as 6,000 — which he shipped back to the USA in order to sell.[48] Despite a brief Hollywood career as director of "Sacred Films, Inc." and president of "Seminole Films Co., Inc." in 1921–22 (CUN25), dealing in tablets was to supplement his main livelihood of growing oranges for the rest of his life, and he came to supply collectors large and small, institutional and private, all over the United States (Wasilewska 2000).

It is not at all clear how Plimpton and Banks came to know each other, for the first of their extant correspondence at Columbia, dated 30 December 1922, already shows Banks to be fully aware of Plimpton's particular wants:

> In my collection of Babylonian tablets which has lately arrived from Bagdad is an unusually large one measuring $7^3/_4$ inches wide and 5 inches high, with ten columns containing an inscription of 57 lines. The first nine columns consist of a series of numbers, with certain explanations of them in the tenth column. It is undoubtedly a mathematical text book, but I am not competent to translate it. The tablet was found in the ruin of Jokha, in Central Babylonia. It comes from about 2350 B.C. About one fifth of it is missing, and it is in two fragments which have been carefully put together, so that it forms an unusually good specimen. The writing is very distinct. The price of it is $50.[49] Should you be interested in seeing it with a view of adding it to your collection of text books, I should be pleased to send it to you for examination, and should you not care to keep it, it may of course be returned. (CUN11)

A sketch was enclosed. Plimpton promptly called in Smith for his opinion (CUN14), who confessed on 25 January 1923:

> I don't know what to say about this tablet. It is probably a table of squares and cubes. The price is rather high, but, on the other hand, the tablet is unusually large and probably is very interesting as a table. (CUN12)

What was the basis for Smith's judgement? It sounds like little more than a wild guess, based simply on the visual complexity of the artefact. Plimpton, it appears, was not entirely convinced, writing warily back to Banks on 29 January, who replied almost immediately:

> I have been holding the tablet, for I thought that you might reply in time. I am sending it to you by parcel post to day. I am not able to translate the tablet, but as I said in my former letter it consists of ten columns of figures, and then one long column of writing which seems to be an explanation of the columns of figures. It is undoubtedly a complicated mathematical tablet, and it should be of unusual importance. Since you desire a literal translation of it, I would suggest that you get into communication with Professor Raymond Dougherty, Goucher College, Baltimore. He would be quite competent to make the translation. So would Professor Albert T. Clay at Yale, but he might be so busy that he would not care to undertake it. (CUN13)

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48 Ewa Wasilewska, pers.comm., 28 November 2001.
49 Equivalent to about $520 today (EH.net).

Was Banks as convinced as Smith of the tablet's mathematical import, or was he simply telling Plimpton what he wanted to hear? Perhaps Plimpton did seek expert help, but apparently without success, for six weeks later he paid out, saying:

> Enclosed please find my check for $50.00 for the Babylonian tablet. I have not yet been able to get it translated, but I take for granted that it is worth this amount of money. Perhaps when it is translated I will find that it is not of any particular value, and then I will want you to take it back. (CUN15)

He never did; the tablet is now no. 348 in the Columbia collection, currently missing. It is probably neither late third millennium in date nor a complicated mathematical tablet, but an Old Babylonian tabular account in twelve columns.

Banks came up with the real goods just two months later. On 28 May 1923 he announced to Plimpton:

> In looking over some Babylonian tablets, which have just come from Bagdad, I have found one which is the multiplication table of five, and thinking that you may desire to possess it, or at least see it, I am sending it to you for examination. If you do not care to keep it, will you kindly return it. The tablet was found at Senkereh, the ruin of the ancient city of Elassar mentioned in Genesis 14:1. It comes from the forat (*sic*, for "first") Babylonian dynasty, and from the time of Hammurabi, King of Babylon. Its approximate date is 2000 B.C. The tablet was found with several letters and business document (*sic*), all of which are dated, but the multiplication tablet is not dated. The inscription or table reads:
> 2 fives are 10.
> 3 fives are 15.
> 4 fives are 20.
> 5 fives are 25.
> 6 fives are 30.
> and so on to the end. The last line reads
> 20 fives are 100.
> Just under the last line is written, "The day 2." That was the day, apparently, when the school boy wrote the tablet, and it probably refers to the 2nd day of the month, rather than of the week.
> The price of the tablet is $12.50.[50]
> I guarantee it to be a genuine ancient Babylonian original. (CUN16)

While this was indeed a genuine tablet from Old Babylonian Larsa, once again it was not quite what Banks claimed it to be: as Smith could have checked in Hilprecht's book (1906), no Babylonian multiplication table starts with 2 and ends at 20. This was in fact an extract from a metrological table of capacities, running from (4) gur = 20 00 (silà) to 20 gur = 1 40 00 (silà). It is now no. 319 in the Columbia collection.

Two months later, Banks was tempting Plimpton with another batch of goodies:

> I have just received from Babylonia twelve account tablets, unlike any I have seen before, and they seem to show the method of book keeping in ancient Babylonian times. The tablets were found at Senkereh, in the ruins of the ancient Elassar in Southern Babylonia, and come from about 2000 B.C. The face of the tablets is divided into squares, and in most of the squares are numerals, with the total of the numerals in the squares at the bottom. On the reverse are two lines containing a note and a date. They are in practically perfect condition. I am able to sell them at ten dollars each, or the twelve for $100.[51] Should you care

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50   Equivalent to about $130 today (EH.net).
51   Equivalent to about $1045 today (EH.net).

to see them, I should be pleased to send them to you for examination, and should you not care to take them, they may of course be returned. The sketch below will indicate the size of the tablets and how the face is inscribed. (CUN17)

On the left is a sketch marked "obverse," showing a tablet in landscape format, ruled into 8 lines of 7 columns. Some cells are marked "blank" and others have cuneiform-like squiggles in them. The reverse to the right has just two lines across the centre with squiggles and the word "date" in the bottom row. The word "reverse" is written underneath.

As usual, Plimpton asked for Smith's opinion (CUN18; CUN19). It seems to have been favourable, for on 21 August Plimpton sent to Banks for them (CUN20). They were delivered by parcel post on 30 August 1923, Banks reiterating their unique and genuine status:

> As you will notice, these tablets are divided into squares containing numerals, and at the bottom a note descriptive of the accounts. As far as I know, these are the only tablets of this type ever discovered. …
> These tablets are so unusual that the little collection should be kept intact and sometime published.
> The lowest price which I am able to accept for the twelve tablets is $100. Should you not care to keep them all, but would select one or two of the best ones, the price should be $12.50 each, but I hope that you may decide to keep them all.[52] I guarantee them to be the genuine ancient Babylonian originals. (CUN21)

Plimpton did indeed decide to keep them all, and wrote a $100 cheque for them and the 'multiplication table' on 24 October (CUN23), Banks having gently nudged him that "a series of embarrassing circumstances just at the present time would make a check most acceptable" (CUN22). The group of tiny tabular accounts, which all date to the same year, do indeed form a unique corpus, and still deserve to be published. They are now nos. 286–294, 314, 323, and 324 of the Plimpton collection at Columbia.

A typed price list of four tablets, signed by Banks, probably also dates to 1923 or thereabouts. It reads:

> No. 1. $5.00. Found at Senkereh, the Biblical Elassar mentioned in Genesis 14:1, in southern Babylonia. The tablet is a school-boy exercise tablet for the practicing of writing. Few of these tablets have been found. They are generally of this shape, nearly flat on one side and rounded on the other. The writing is coarse, and the writing upon them consists of signs only, or sometimes words without forming sentences. The clay is sun dried clay, for there was little use in preserving the tablet. This tablet comes from the first dynasty of Babylon, and dates from the time of Hammurabi, King of Babylon about 2250 B.C.
> No. 2. $3.00. Found at Senkereh in southern Babylonia. This is a sun-dried tablet which was used as an exercise for an arithmetical lesson. There are about three columns of numerals upon each side. The date is about 2300 B.C.
> No. 3. $10.00. Found at Senkereh. A very large burned tablet with one edge broken away, but with the inscription practically complete. It is a mathematical tablet, and the column at the right contains the numerals 1 to 15. The numbers in the columns at the left are very large, and it seems to me that they are the cubes or squares of the numbers in the column at the right. It was used as a mathematical text book. The date is about 2250 B.C.
> No. 4. $2. Found at Drehem, a suburb of Nippur. The tablet is about the average in size, and in a perfect state of preservation. It is a receipt for sheep and goats. It is dated in the early part of the Ur dynasty of kings who ruled from 2400 to 2100 B.C. It comes from about 2350 B.C.

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52 Notice that the price has risen from $10 given in the earlier letter.

I guarantee each of the four tablets described above to be genuine ancient Babylonian tablets.[53] (CUN24)

Each of these can be identified, more or less, with tablets in Plimpton's collection at Columbia. The first, a typical round OB exercise tablet, must be either no. 266 or no. 267. The second is no. 317, the fourth no. 67, while the third is no other than the famous Plimpton 322. Banks identified it as a mathematical tablet, ironically, by its final column, which is simply a line count 1–15. Plimpton, it is fairly certain, went to his grave ignorant of the fact that in time this $10 clay tablet would prove to be an absolute bargain, and perhaps his most important mathematical acquisition of all.

Obliged to sell: the Banks-Plimpton correspondence, 1934–36

In October 1934, after a silence of over a decade, Banks was in touch with Plimpton again, offering a Lipit-Ishtar cone for sale:

> In a small collection of Babylonian antiquities which has just come from Bagdad are several terra cotta cones about four inches long and in a perfect condition. They were found at Ur of the Chaldees, the birthplace of Abraham, where the British Museum has been excavating. They bear a fine new inscription of twenty lines from Libit-Ishtat (*sic*), a prominent Babylonian king from 2150 B.C., just before the time of Abraham. The inscription is new and is now being translated by one of the Harvard professors. It is a fine illustration of the writing and culture of the exact age of Abraham.
>
> The owner of the collection sent it to me expecting that I would buy it, but I am not able to do so. I am returning it all but the cones, and they are so rare and valuable that they should be kept in this country. Therefore I am offering them to a few who would appreciate them for just the same price that I must pay for them, that is $15 each, without any profit whatsoever for myself. They are worth much more than that. I am wondering if you would care to have one of them to add to your collection of Babylonian inscriptions? If so, I should be pleased to send one of them to you to see, and of course it may be returned should you not wish to keep it. (CUN26)

Plimpton, aged 78, was by this time using his secretary Bridgewood as amanuensis, who wrote back,

> He would be very glad to have you send one to him for inspection,- one of an educational nature if possible,- and he would like by all means to have the translation of the inscription made by one of the Harvard professors. (CUN27)

With no further ado, the cone was in the post, and a cheque followed within the week (CUN28; CUN29).[54] The cone is now Columbia no. 281, and must have been the last cuneiform object to enter the Plimpton collection.

Plimpton had retired from Ginn & Co. in 1931, at the age of 75. He began to think about the long-term security of his enormous book and manuscript collection, which was already housed in a purpose-built fire-proof library attached to his house at 61 Park Avenue, between 37th and 38th Streets in Manhattan (Donoghue 1998: 364). He had been a founder member of the Friends of the Columbia University Libraries and was its

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53 The modern price equivalents are: (1) $53, (2) $32, (3) $107, (4) $21 (EH.net).
54 Plimpton mentioned to Banks that "I was out in Chicago last week and saw Professor Breasted and the museum, which is very fine" (CUN29).

first chairman from 1928 until his death (Plimpton 1993: 1). It was only natural, then, that he should offer his collection, amounting to over 16,000 items, to that institution. Smith offered his papers too and the hand-over took place over 1934–36 (Plimpton 1993: 1; DES19). Smith made arrangements for the tablets to be catalogued, which he described to Ferris J. Stephens at Yale on 28th April 1934:

> Dr. Isaac Mendelsohn, whose address is Columbia University Library [is] in charge of the cataloguing of some cuneiform tablets which I have presented to the University and which relate chiefly to mathematical accounts and probably mathematical terms.
>
> Dr Mendelsohn feels that he would like to be perfectly sure of his ability to handle the mathematical terms. He is to begin work on my tablets at once and will have them all catalogued on my return from Istambul on July 11th. (DES19)

The resulting work, which comprised some 380 items including the 50 from Smith and Plimpton, eventually appeared almost a decade later (Mendelsohn 1943), and it was through the photograph published there that Neugebauer and Sachs (1945) discovered the true mathematical import of Plimpton 322.

Meanwhile, by January 1936 Banks was on his uppers, forced at last to sell his own private collection which he had wanted to keep for himself or to sell whole to a big university or museum. However, money was short and he was desperate. He renewed old acquaintances and picked out possible new contacts from social columns and *Who is who in America* (Marquis 1899–), offering tablets to them.[55] Naturally, Plimpton was on his list:

> I am obliged to sell my collection of ancient Babylonian seals which I obtained in Babylonia many years ago. These seals are of a cylindrical shape, and are of hematite, onyx, alabaster and other stones and are engraved with the figures of Babylonian gods, priests, demons, animals, and with geometrical designs. They are considered the most beautiful objects left by the Babylonians. They were used as the signatures of their owners, and to roll over the soft clay of the contract tablets or business documents to prevent forgery. They were also worn about the neck or wrists as charms, and when their owners died, the selas (*sic*) were buried with them. They come from every period of Babylonian history, and no two of them have ever been found alike.
>
> The seals are now valuable not only as objects of Babylonian art, but they are also highly prized as pendants, fobs and similar objects, and they make most acceptable gifts. They are priced from $8 to $50 each, much less than their real value. Should you wish, I should be pleased to send one or more of them to you for your examination, to be returned if not desired. I positively guarantee them to be the genuine ancient Babylonian originals. (GAP15)

Banks signed off as "Field Director of the Recent Babylonian Expedition from the University of Chicago" — from which he had resigned apparently in disgrace some thirty years before. Plimpton, via Bridgewood, asked for further particulars of the seals (GAP16) and Banks promptly replied:

> Some of the seals I have already sold, but I still have a very fine collection of ten of them. They are made of several different kinds of stone, as hematite, chalcedony, crystal, marble, calcite, and others. They come from almost every period of Babylonian history, and all are in a fine condition. They are engraved with various designs, as the Babylonian gods and priests, animals and geometrical designs. I am enclosing wax impressions of two of them that you may form some idea of the engravings.

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55 Ewa Wasilewska, pers.comm. 28 November 2001.

> I have priced the ten cylinders very reasonably, and altogether the prices amount to $283, but should you wish to take the entire collection, the price may be $250. ...
>
> May I also ask if you would be interested in a small barrel-shaped terra cotta cylinder of Nebuchadnezzar, King of Babylon? It is one of the choicest objects in my collection, and I would part with it only because my circumstances compel me to do so. It measures about $5^1/_2$ inches in length and nearly eight inches in its largest circumference. It is hollow, with an opening at each end. The inscription is in two columns, containing 36 lines of cuneiform writing. I am not aware that the inscription has ever been translated, but of this I am not sure. I am not competent to translate but the first five lines, and the translation of those lines reads: "Nebuchadnezzar, King of Babylon, the restorer of the temples Esagil and Ezida, the first born son of Nabopolassar [*added by hand:* King of Babylon], am I." It continues with an account of the restoration of the temple of the sun god, Shamash, at Sippar, and I think that it ends with a prayer. The cylinder is in perfect condition, and the inscription is perfectly legible. I am asking but $200 for it. Should you be interested in seeing it, I should be pleased to send it to you for examination.[56] (GAP17)

Plimpton was not interested in seeing the barrel cylinder, or in purchasing the seals. He had not forgotten, however, the last promise Banks had made to him:

> I should like to get those translated which I have already bought from you. The last one you stated went back to the days of Abraham. You said you would send me a translation of it, but I never got it. (GAP18)

Banks wrote back promptly and apologetically on 18 February with the translation of cone no. 281, "which was made by Professor Robert Pfeiffer of the Semitic Museum of Harvard University, and I am still enough of a Babylonian scholar to verify it, and it is correct" (GAP19). Plimpton died a few months later, on 1 July 1936, just short of his 81st birthday.

Much interested in the whole field: Smith's letters to Assyriologists, 1929–39

In the year of Plimpton's death, Smith was honoured as a major figure in the history of mathematics with a dedication in the first issue of the journal *Osiris* (Sarton 1936; Frick 1936). Even now he is considered "a major influence in establishing the history of mathematics as both an intellectual discipline and as a profession in the United States" (Lewis 1999: 160). His two-volume *History of mathematics* textbook, first published in 1923–25 (the time of Plimpton's first correspondence with Banks), had acquired the status of a classic, and remains in print today (Smith 1923; 1925). For its time, it has an unusually strong focus on pre-Classical topics, with a first chapter on "Prehistoric Mathematics" and a second on "The Historic Period Down to 1000 BC," including six pages on Babylonian arithmetic. The preparatory work on this section (and others) are preserved at Columbia, including index cards, magazine cuttings, and an 11-page handwritten draft written in or shortly after 1907 and showing heavy dependency on Hilprecht (1906).[57] A sourcebook of historic mathematical writings, focusing on the period post-1450 (AD!), followed shortly afterwards (Smith 1929).

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56   The wax impressions of the seals are preserved at Columbia with the letter. The modern equivalents of the prices Banks quotes are respectively $3600, $3200, and $2550 (EH.net) — a significant increase on the prices he was offering in the early 1920s.

57   D. E. Smith Professional Collection, Box 90: Notes on arithmetic — Babylon.

Smith retained a keen interest in Mesopotamian mathematics, communicating with mathematically minded Assyriologists about the breakthroughs made by the Neugebauer school in the late 20s and early 30s — which sadly came a decade too late for inclusion in his book. In mid-1929 he wrote to C. J. Gadd at the British Museum, who had published a large fragment of the geometrical tablet BM 15285 (Gadd 1922; Robson 1999: 209–218). This had proved an important key to Old Babylonian geometry, for its diagrams enabled many important technical terms to be identified with certainty. Gadd replied:

> Certainly it seems likely that our knowledge of Babylonian mathematics may soon be a good deal more advanced. … As to material in the British Museum, I am much hoping to be able to devote some attention to it before long, but my present circumstances are such that I cannot undertake any new tasks in the near future. But there is no branch of study in which I am more interested. (DES 15)

Smith also followed Neugebauer's career from Göttingen to Copenhagen to the United States (DES25) and reviewed his work (Smith 1935). In a letter of June 1929 Neugebauer outlined his plans for *Mathematische Keilschrifttexte* (Neugebauer 1935–37) and the series *Quellen und Studien* to which it belonged (DES14). Twice he apologised to Smith for being too busy with this work to write for the *American Mathematical Monthly* or even for Smith's own Festschrift (DES16; DES20). They finally met in 1939, shortly after Neugebauer's appointment to the professorship at Brown (DES24). At around this time Smith also received offprints from Thureau-Dangin (DES22; DES23), whose rival *Textes mathématiques babyloniennes* had recently been published (Thureau-Dangin 1938*a*; 1938*b*; 1938*c*).[58] Smith died in 1944 at the age of 84.

What, then, were Smith and Plimpton's contributions to the fledgling field of Babylonian mathematics? They were not as great or as many as they might have been. In particular a collaboration between Hilprecht and Smith, had circumstances been different, could have opened the floodgates to the decipherment of mathematical cuneiform texts two decades before Neugebauer. Foster (1999*b*) has reflected that "Hilprecht's substantial strengths as a scholar and success as a teacher were undoubtedly undermined by his inordinate vanity [and] inability to admit mistakes"; the solipsism, hypochondria, and defensiveness of his letters to Smith are a poignant case in point. But the blame for missed opportunities cannot be laid solely at Hilprecht's door. The pamphlets that Plimpton enclosed so regularly with his letters of enquiry to Hilprecht, Prince, Breasted, Pinches, and others — and the frequent invitations to visit his collection — were not simply offerings in a system of academic gift exchange (Kittredge 1906; Plimpton 1933). Being concerned with the very objects he had acquired as a collector of considerable means, they made a clear statement of financial wherewithal as well as intellectual engagement. If any of his Assyriological correspondents had chosen to cultivate him he might have proved as dedicated and generous a long-term benefactor to the field as he was to other academic causes.

Plimpton and Smith nevertheless made significant impacts on the subject in their different ways. Smith, through his review of Hilprecht's work in a prominent mathematics journal (Smith 1907*a*), was responsible for drawing the attention of the English-speaking mathematical community to Old Babylonian mathematics for the first time. Plimpton, on

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58 Smith also corresponded sporadically with Breasted in Chicago, but these letters were more social than academic (DES12; DES13; DES17; DES18).

the other hand, rescued from potential oblivion the mathematical tablet that posthumous-
ly made his name. Since 1945 Plimpton 322 has been famous the mathematical world over
and has been to a large degree responsible for establishing the reputation of Old Babylonian
mathematics as a sophisticated and fascinating subject of study. In more recent times
Christopher Walker has done much to perpetuate and enhance that reputation by stimu-
lating the publication of mathematical cuneiform tablets in the British Museum; it is there-
fore particularly appropriate that we celebrate and applaud his contribution to the field in
this his sexagenary year.

APPENDIX: The Plimpton and Smith collections of cuneiform tablets in the Rare
Book and Manuscript Library of Columbia University

Plimpton donated thirty-four tablets to Columbia, of which nineteen are documented in
his correspondence; Smith gave sixteen, none of which can be traced in his archives. How
many of those are the mathematical and school exercise tablets they had hoped for?

Smith was least successful, with just one round exercise tablet to his name (no. 268):
the rest are all Ur III (Garfinkle *et al.*, to appear), OB, and NB economic records. Even no.
325, which Mendelsohn catalogued as a mathematical exercise, turns out to be an undat-
ed Old Babylonian account of three quantities of dates. Plimpton had better luck: eight of
his were what he had wanted. Only no. 321, a Kassite or late OB tabular account, has been
badly mis-catalogued: Mendelsohn's description of it as a "plan of a house" probably refers
to no. 320, identified as a "plan of real estate property" but which is in fact a mathemati-
cal exercise.

In the table below M stands for Mendelsohn (1943), P for Plimpton, S for Smith.
Descriptions in quotes are taken straight from Mendelsohn's catalogue; others are my own.

Museum no.	Provenance	Description
P 004	–	"Account of slaughtered animals." Ur III: Shulgi 32
P 011	–	"Daily list of sacrificed animals." Ur III: Shulgi 43
P 029	–	"Record of a sheep." Ur III: Shulgi 46
P 067	Banks, no date (CUN24 no. 4): Puzrish-Dagan	"Receipt for slaughtered animals." Ur III: Amar-Suen 2
S 091	–	"Record of cattle for sacrifice." Ur III: Amar-Suen 6
S 099	–	"Consignment of plants." Ur III: Amar-Suen 8
S 100	–	"List of canal diggers." Ur III: Amar-Suen 8
S 102	–	"Account of herbs, salt, and reeds." Ur III: Amar-Suen 8
P 266	Banks, no date. (CUN24: no. 1) or Messayeh 1915 (CUN08): Larsa?	Round OB school tablet (Type IV), *c.* 7 cm diameter. Un-identified composition with 3 lines each on obverse and reverse (reverse is copy of obverse): ni-du-ni ni-du-di ni-im-di Copied below [Figure 5].

Museum no.	Provenance	Description
P 267	Banks, no date (CUN24: no. 1) or Messayeh 1915 (CUN08): Larsa?	Round OB school tablet (Type IV), *c.* 7.5 cm diameter. List of personal names with 3 lines on obverse only (Chiera 1916–19: I 60, lines 119–121): ^{1}*ib-ni*-AN ^{1}*ib-ni*-é-a ^{1}*ib-ni*-^{d}IŠKUR Copied below [Figure 6].
S 268	–	Round OB school tablet (Type IV), *c.* 8–9 cm diameter. Unidentified composition with three lines on obverse only. Copied below [Figure 7].
P 269	–	"List of labourers and their food rations." Ur III, no date
S 270	–	"Allowance of grain to various individuals." Ur III, no date
S 271	–	"List of animals." Ur III, date missing
S 273	–	"Donation of animals." Ur III, no date
S 275	–	"Temple-tablet: list of daily rations (herbs, salt, and reeds)." Ur III, no date
P 277	–	"Account of animals." Ur III, no date
P 278	–	"Account of wool." Ur III, no date
P 279	Messayeh 1915 (CUN08)	"Votive inscription of Sin-kašid king of Uruk." Cone, OB
P 280	Messayeh 1915 (CUN08)	"Copy of no. 279." Cone, OB
P 281	Banks 1934 (CUN26)	"Votive inscription of Lipit-Ishtar." Cone, OB
S 283	–	"List of animals." OB: Nur-Adad 2
P 286–294	Banks 1923 (CUN17): Larsa	Nine tabular accounts of animal fodder (Robson, to appear). OB: Rim-Sin 31
P 314	Banks 1923 (CUN17): Larsa	Tabular account of animal fodder (Robson, to appear). OB: Rim-Sin 31
P 315	–	"Account of animals and hides given out to various individuals." OB, no date
P 316	Messayeh 1915 (CUN08)?	Upper left hand corner of OB school tablet (Type II), *c.* 11.5× 5.5 cm. Obverse Proto-Ea lines 74–92 (Civil 1969: 21, source Dm "Plimpton 31"), reverse List of Trees and Wooden Objects (OB Ur$_5$-ra 1), lines 282–296 and 18+ damaged lines in the right hand column. See Veldhuis (1997: 157–8). Copied below [Figure 8].
P 317	Banks, no date (CUN24: no.2): Larsa	OB school tablet (Type III), *c.* 8.5×4 cm. Unfinished extract of metrological table of weights, from 1 še = 0;00 00 20 (mina) to 14 <še = 0;00 04 40 (mina)> on obverse. Colophon and catchline to table of lengths on reverse: ^{1}ur$^?$-^{d}nanna ^{1} 1 šu-si = 0;00 10 (ninda)

Museum no.	*Provenance*	*Description*

This is the only instance I know of a catchline following a colophon on a metrological or mathematical school tablet — or a catchline outside Nippur, or a catchline on an unfinished tablet (Robson 1997: 67–70). Copied below [Figure 9].

P 318 Messayeh 1915 (CUN08)?

OB school tablet (Type III), now *c.* 7×4.5 cm. Inverse table of squares running from obverse to reverse, from $0;15 = 0;30^2$ to $0;58\ 01 = 0;59^2$, and ending with the 'funny numbers' $1;02\ 03\ 02\ 01 = 1;02\ 01^2$ (Neugebauer and Sachs 1945: 34; Friberg 1987–90: 546). Colophon (?) on the left edge:

[1]en-ḫé-[...]

The tablet is now in two pieces. The bottom edge has been deliberately smoothed to give the appearance of a complete tablet, although about a third of the original must be missing. Copied below [Figure 10].

P 319 Banks 1923 (CUN16): Larsa

Badly preserved OB school tablet (Type III), *c.* 6.5×4 cm. Extract from metrological table of capacities, now running from [4] gur = 20 00 (sila) to 20 gur = 1 40 00 (sila) and ending with a double horizontal ruling and an illegible colophon. According to Banks' description (above) the extract originally started at 1 gur and the colophon included the phrase "day 2"; too fragile to copy.

P 320 Messayeh 1915 (CUN08)?

OB school tablet, roughly square, *c.* 7×6.5 cm. Mathematical exercise and diagram about quadrilateral areas on the obverse; reverse blank. Copied below [Figure 11].

The external measurements of the figure are 60 (length), 40 (left width) and 20 (right width). The underlying problem appears to have been to find the two internal widths — 33;20 and 26;40 — if the length is trisected equally, and to find the area of the three resulting figures using the standard method of multiplying average widths and lengths:
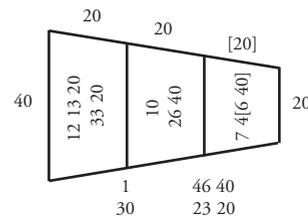
$$20 \times \frac{(40+33;20)}{2} = 12\ 13;20$$

$$20 \times \frac{(33;20+26;40)}{2} = 10\ 00$$

$$20 \times \frac{(26;40+20)}{2} = 7\ 46;40$$

Part of the last calculation — averaging the opposite widths — is written very roughly over multiple erasures immediately below the diagram. See Friberg (1987–90: 556) and cf. Ash 1922.168 (Robson 1999: 273).

| Museum no.	Provenance	Description
P 321	–	Kassite (?) account document
P 322	Banks, no date (CUN24: no. 3): Larsa	OB school tablet. Headed mathematical table, of 'Pythagorean' triples and associated calculations (Neugebauer and Sachs 1945: text A; Buck 1980; Friberg 1981; Robson 2001; 2002).
P 323–324	Banks 1923 (CUN24): Larsa	Two tabular accounts of animal fodder (Robson, to appear). OB: Rim-Sin 31
S 325	–	"Mathematical exercise tablet" — in fact an account of dates. OB, date missing
S 326	–	"Receipt for money." OB, date missing
S 334	–	"Receipt for money and cattle." OB, date missing
P 348	Banks 1922 (CUN11): Umma	Tabular account, currently missing.
S 355	–	"Almost completely illegible." NB
S 357	–	"Responsibility assumed for a debtor." NB: Cyrus 1
S 363	–	"Allotment of provisions." NB, no date
P 380	–	"Food given out to various individuals." NB, no date
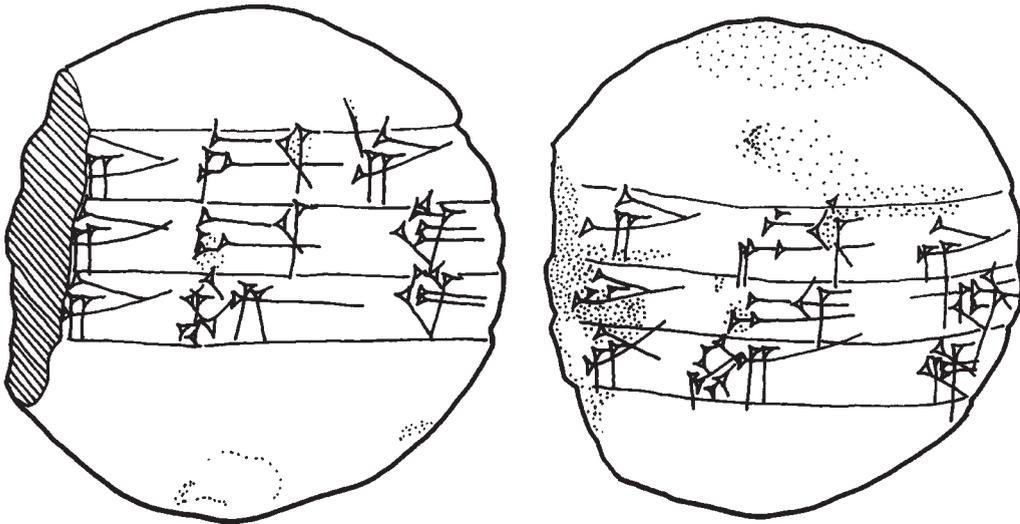
Figure 5: Columbia (Plimpton) 266 obverse and reverse
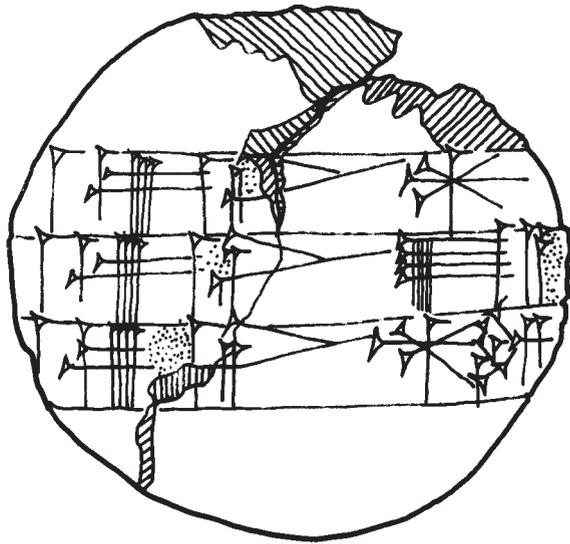
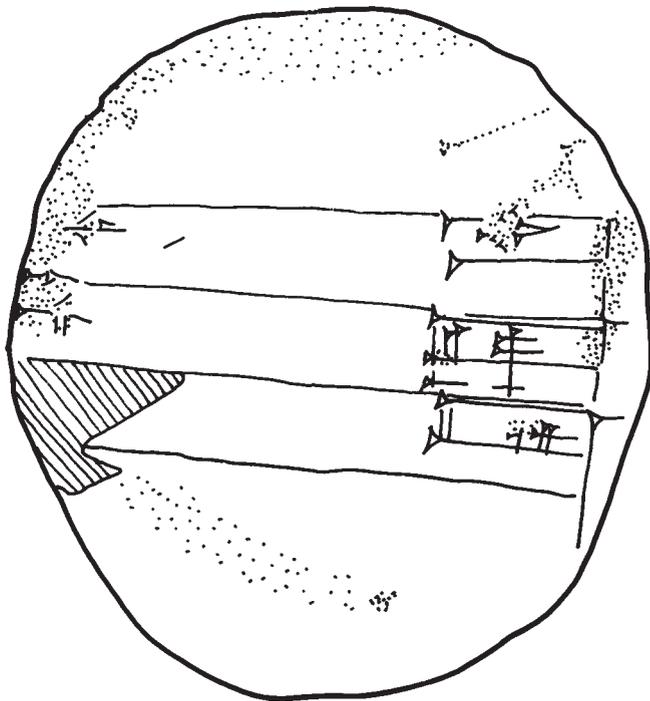Figure 6: Columbia (Plimpton) 267 obverse; reverse blank.

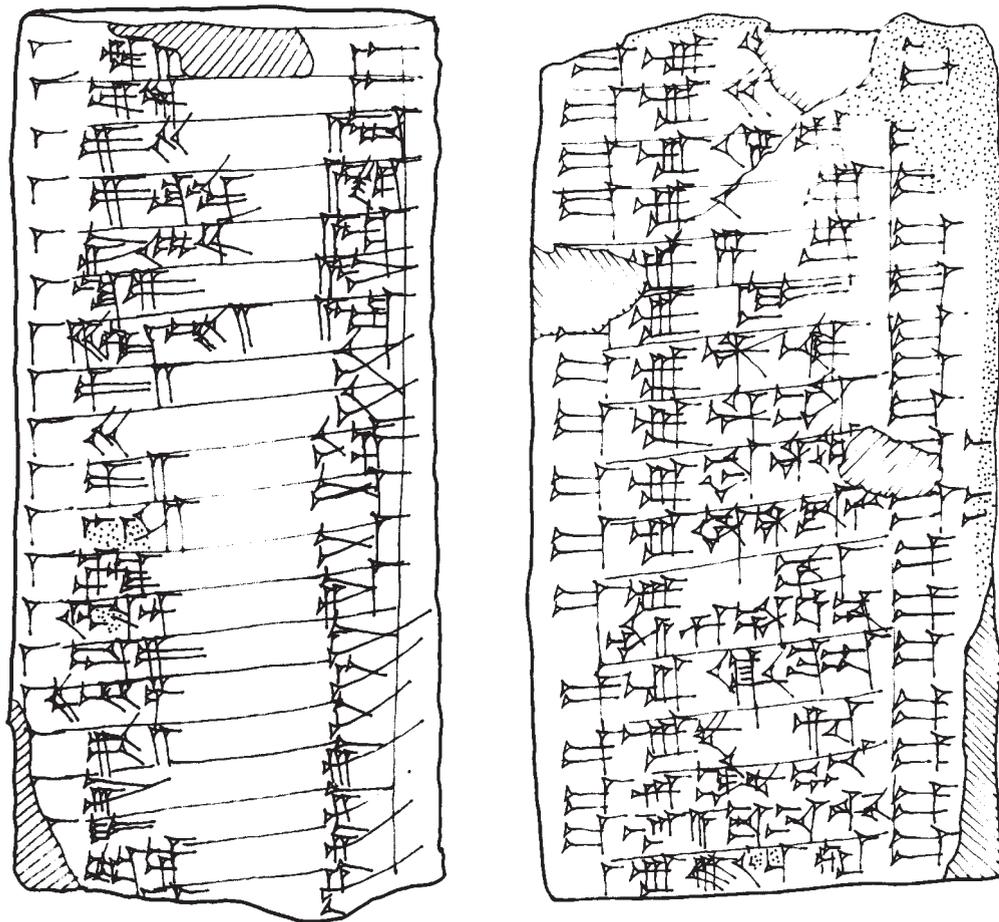Figure 7: Columbia (Smith) 268 obverse; reverse blank.

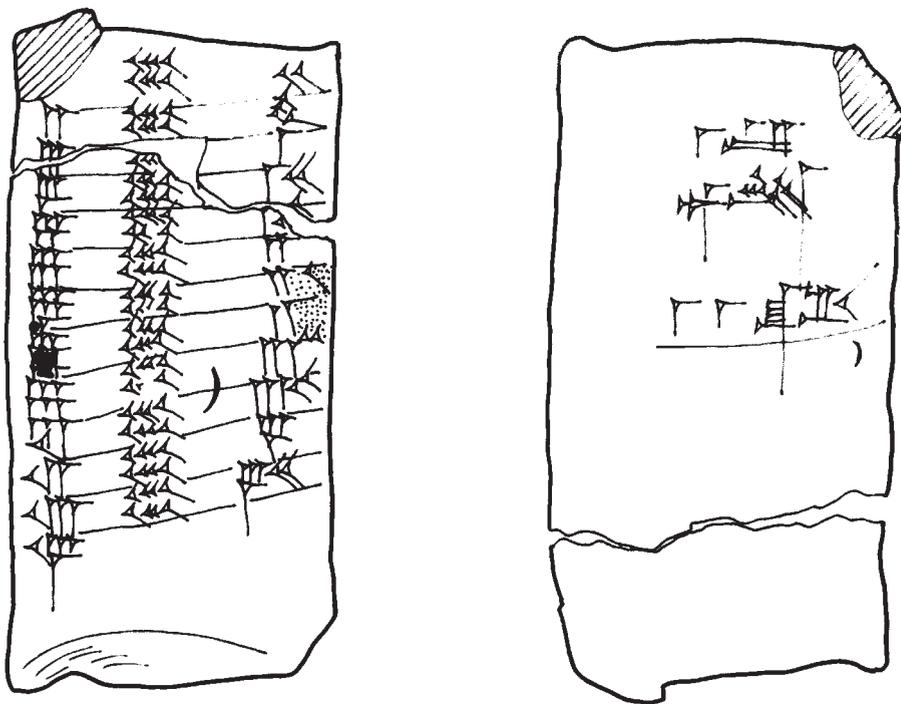Figure 8: Columbia (Plimpton) 316 obverse and reverse

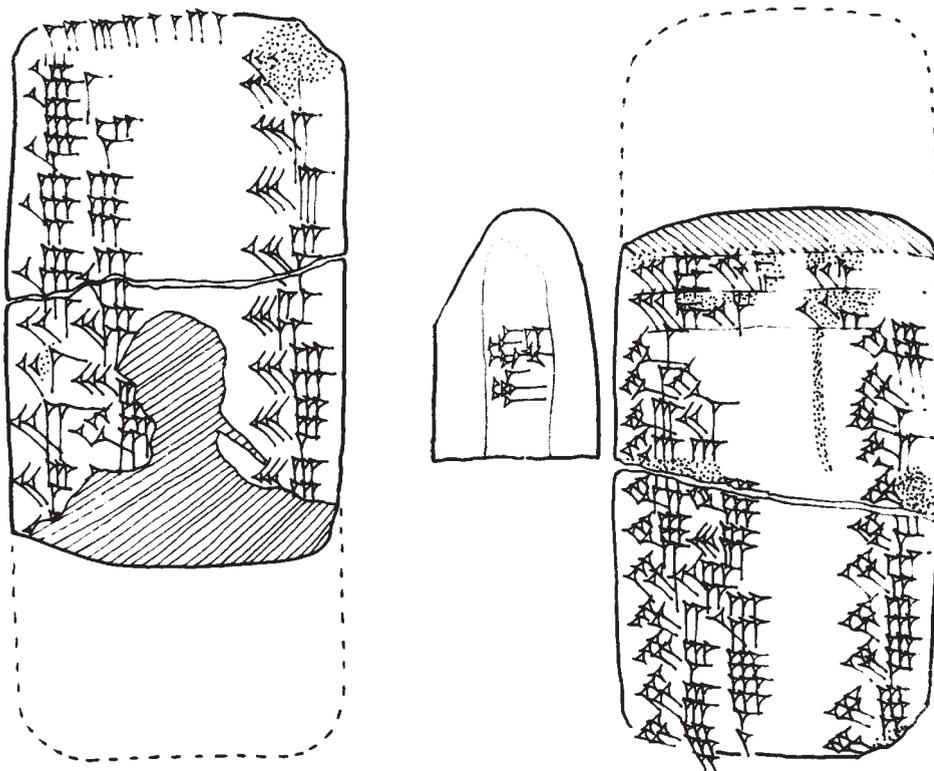Figure 9: Columbia (Plimpton) 317 obverse and reverse

Figure 10: Plimpton 318 obverse, left edge and reverse, showing approximate original size of tablet.
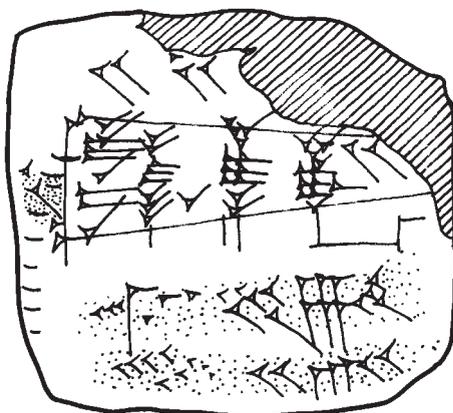

Figure 11: Columbia (Plimpton) 320 obverse; reverse blank.

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CUN03 Letter from G. A. Plimpton to T. G. Pinches, 2.ii.1907. Carbon copy of 1 page typescript.

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CUN05 Letter from G. A. Plimpton to T. G. Pinches, 25.ii.1907. Carbon copy of 1 page typescript.

CUN06 Typewritten label describing casts of Nippur tablets in Philadelphia, no date (1907?).

CUN07 Typewritten label describing casts of Nippur tablets in Constantinople, no date (1908?).

CUN08 Letter from R. D. Messayeh to G. A. Plimpton, 29.iv.1915. Original of 1 page typescript.

CUN09 Letter from G. A. Plimpton to R. D. Messayeh, 1.vii.1915. Carbon copy of 1 page typescript.

CUN10 Letter from R. D. Messayeh to G. A. Plimpton, 8.vii.1915. Original of 1 page typescript.

CUN11 Letter from E. J. Banks to G. A. Plimpton, 30.xii.1922. Original of 1 page typescript and 1 page manuscript.

CUN12 Letter from D. E. Smith to G. A. Plimpton, 25.i.1923. Original of 1 page typescript.

CUN13 Letter from E. J. Banks to G. A. Plimpton, 2.ii.1923. Original of 1 page typescript.

CUN14 Note to G. A. Plimpton concerning D. E. Smith, 23.ii.1923. Original of 2 page manuscript.

CUN15   Letter from G. A. Plimpton to E. J. Banks, 21.iii.1923. Carbon copy of 1 page typescript.

CUN16   Letter from E. J. Banks to G. A. Plimpton, 28.v.1923. Original of 1 page typescript.

CUN17   Letter from E. J. Banks to G. A. Plimpton, 25.vii.1923. Original of 1 page typescript.

CUN18   Letter from G. A. Plimpton to D. E. Smith, 1.viii.1923. Carbon copy of 1 page typescript.

CUN19   Letter from G. A. Plimpton to D. E. Smith, 2.viii.1923. Carbon copy of 1 page typescript.

CUN20   Letter from G. A. Plimpton to E. J. Banks, 21.viii.1923. Carbon copy of 1 page typescript.

CUN21   Letter from E. J. Banks to G. A. Plimpton, 30.viii.1923. Original of 1 page typescript.

CUN22   Letter from E. J. Banks to G. A. Plimpton, 17.x.1923. Original of 1 page typescript.

CUN23   Letter from G. A. Plimpton to E. J. Banks, 24.x.1923. Carbon copy of 1 page typescript.

CUN24   Document signed by E. J. Banks, no date (1923?). Original of 1 page typescript.

CUN25   Curriculum vitae of E. J. Banks, no date (1923?). Original of 1 page typescript.

CUN26   Letter from E. J. Banks to G. A. Plimpton, 5.x.1934. Original of 1 page typescript.

CUN27   Letter from E. M. Bridgewood (Plimpton's secretary) to E. J. Banks, 9.x.1934. Carbon copy of 1 page typescript.

CUN28   Letter from E. J. Banks to G. A. Plimpton, 11.x.1934. Original of 1 page typescript.

CUN29   Letter from G. A. Plimpton to E. J. Banks, 23.x.1934. Original of 1 page typescript.

G. A. Plimpton Collection, catalogued correspondence (*except where noted*)

GAP01   Letter from G. A. Plimpton to H. V. Hilprecht, 18.x.1904. Carbon copy of 1 page typescript; cf. HVH02 below. Collecting: dealers, H.

GAP02   Letter from G. A. Plimpton to H. V. Hilprecht, 29.xi.1904. Carbon copy of 1 page typescript; cf. HVH03 below. Collecting: dealers, H.

GAP03   Letter from G. A. Plimpton to J. D. Prince, 15.iii.1906. Carbon copy of 1 page typescript. Box 26: Collecting, 1898–1921.

GAP04   Letter from G. A. Plimpton to C. Borden, 2.vi.1906. Carbon copy of 1 page typescript. Box 32: Near East.

GAP05   Letter from I. Dodd to G. A. Plimpton, 8.ii.1908. Original of 1 page typescript. Box 26: Collecting, 1898–1921.

GAP06   Letter from G. A. Plimpton to I. Dodd, 13.ii.1908. Carbon copy of 1 page typescript. Box 26: Collecting, 1898–1921.

GAP07   Letter from G. A. Plimpton to I. Dodd, 24.ii.1908. Carbon copy of 1 page typescript. Box 26: Collecting, 1898–1921.

GAP08   Letter from G. A. Plimpton to J. L. Heiberg, 24.ii.1908. Carbon copy of 1 page typescript. Box 26: Collecting, 1898–1921.
GAP09   Letter from D. E. Smith to G. A. Plimpton, 20.ii.1908.
GAP10   Letter from G. A. Plimpton to D. E. Smith, 5.iii.1908.
GAP11   Letter from G. A. Plimpton to D. E. Smith, 7.v.1908.
GAP12   Letter from D. E. Smith to G. A. Plimpton, 21.v.1908.
GAP13   Letter from J. H. Breasted to G. A. Plimpton, 25.xi.1912.
GAP14   Letter from J. H. Breasted to Mrs G. A. Plimpton, 25.xii.1920.
GAP15   Letter from E. J. Banks to G. A. Plimpton, 18.i.1936. Original of 1 page typescript. Box 26: Collecting, 1936.
GAP16   Letter from E. M. Bridgewood to E. J. Banks, 7.ii.1936. Carbon copy of 1 page typescript. Box 26: Collecting, 1936.
GAP17   Letter from E. J. Banks to G. A. Plimpton, 9.ii.1936. Original of 1 page typescript. Box 26: Collecting, 1936.
GAP18   Letter from G. A. Plimpton to E. J. Banks, 14.ii.1936. Carbon copy of 1 page typescript. Box 26: Collecting, 1936.
GAP19   Letter from E. J. Banks to G. A. Plimpton, 18.ii.1936. Original of 1 page typescript. Box 26: Collecting, 1936.

D. E. Smith Professional Collection, catalogued correspondence (*except where noted*)

DES01   Letter from H. V. Hilprecht to D. E. Smith, 14.ii.1907. Original of 2 page manuscript.
DES02   Letter from D. E. Smith to H. V. Hilprecht, 18.ii.1907. Carbon copy of 6 page typescript.
DES03   Letter from H. V. Hilprecht to D. E. Smith, 20.iii.1907. Original of 7 page manuscript.
DES04   Letter from H. V. Hilprecht to D. E. Smith, 21.iii.1907. Original of 1 page manuscript.
DES05   Letter from H. V. Hilprecht to D. E. Smith, 31.v.1907. Original of 3 page manuscript.
DES06   Letter from H. V. Hilprecht to D. E. Smith, 28.vii.1908. Original of 6 page manuscript.
DES07   Letter from H. V. Hilprecht to D. E. Smith, 22.x.1908. Original of 2 page manuscript.
DES08   Letter from H. Edhem to D. E. Smith, 28.xi.1908.
DES09   Letter from D. E. Smith to H. Edhem, 6.i.1909.
DES10   Letter from H. V. Hilprecht to D. E. Smith, 6.iv.1909. Original of 2 page manuscript.
DES11   Letter from H. V. Hilprecht to D. E. Smith, 13.iv.1909. Original of 1 page manuscript.
DES12   Letter from J. H. Breasted to D. E. Smith, 25.iv.1918.
DES13   Letter from J. H. Breasted to D. E. Smith, 28.v.1919.
DES14   Letter from O. Neugebauer to D. E. Smith, 15.vi.1929. Original of 2 page typescript.

DES15   Letter from C. J. Gadd to D. E. Smith, 17.vii.1929. Original of 1 page manuscript.

DES16   Letter from O. Neugebauer to D. E. Smith, 17.vi.1931. Original of 1 page typescript.

DES17   Letter from J. H. Breasted to D. E. Smith, 13.xii.1932.

DES18   Letter from J. H. Breasted to D. E. Smith, 16.i.1933.

DES19   Letter from D. E. Smith to F. J. Stephens, 28.iv.1934. Carbon copy of 3 page typescript. Box 59: Miscellaneous correspondence, S.

DES20   Letter from O. Neugebauer to D. E. Smith, 7.x.1936. Original of 1 page typescript.

DES21   Letter from O. Neugebauer to D. E. Smith, 27.xii.1936. Original of 1 page typescript.

DES22   Letter from D. E. Smith to F. Thureau-Dangin, 24.x.1938. Carbon copy of 1 page typescript. Box 59: Miscellaneous correspondence, T.

DES23   Letter from D. E. Smith to F. Thureau-Dangin, 24.i.1939. Carbon copy of 1 page typescript. Box 59: Miscellaneous correspondence, T.

DES24   Letter from O. Neugebauer to D. E. Smith, 24.ii.1939. Original of 1 page typescript.

DES25   Cutting from *Christian Science Monitor*, "European savant accepts chair at Brown University" , 27.ii.1939. Catalogued correspondence: O. Neugebauer.

BIBLIOGRAPHY: UNPUBLISHED DOCUMENTS
HELD BY THE UNIVERSITY OF PENNSYLVANIA MUSEUM ARCHIVES

HVH01   Letter from G.A. Plimpton to H.V. Hilprecht, 18.x.1904. Original of 1 page typescript, annotated by H.V. Hilprecht. Near East Section – Hilprecht – Box 1: correspondence 1901–1905. Cf. GAP01 .

HVH02   Letter from G.A. Plimpton to H.V. Hilprecht, 29.xi.1904. Original of 1 page typescript, annotated by H.V. Hilprecht. Near East Section – Hilprecht – Box 1: correspondence 1901–1905. Cf. GAP02 .

HVH03   Letter from H.V. Hilprecht to W.H. Furness 23.xii.1904. Original of 3 page manuscript. Near East Section – Hilprecht – Box 1: correspondence 1901–1905.

HVH04   Letter from S.M. Neilson (D.E. Smith's secretary) to H.V. Hilprecht, 19.ix.1907. Near East Section – Hilprecht – Box 1: correspondence 1906–1910.

HVH05   Anonymous handwritten document, no date. Near East Section – Hilprecht – Box 5: Hilprecht Controversy, 1898–1911.