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Toward a Proposal for an Alchemy Unicode Plane

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The early organizers of the Unicode Consortium envisioned the creation and organization of a code plane devoted to alchemical symbols. Some alchemical symbols have already been included in existing planes, especially the Miscellaneous Symbols plane (u2600). (See Table 1. Existing Coverage of Alchemy in Unicode.) The idea of organizing a plane for alchemical symbols holds clear benefits for historians, chemists, philologists, and their professional colleagues but also for a large community interested in alternative knowledge and New Age disciplines and, potentially, a third large community working in computer gaming, graphics, and fonts.

Alchemical symbols were in use from the fifth or sixth century C.E. through at least the end of the eighteenth century. They were especially important in Europe after the fourteenth century. European alchemists, natural philosophers, chemists, and apothecaries developed and used several parallel systems of symbols but a number of symbols created by Greek and Arabic writers were recognized and used over the entire thirteen centuries. Alchemical (or to use the common seventeenth-century term, "chymical") works published in what is best described as a textbook tradition in the seventeenth and eighteenth centuries routinely included tables of symbols that probably served to spread their use.

The NSF- and NEH-funded Newton's Chymistry Project at Indiana University has put together a collection of those synoptic tables with the help of the Chemical Heritage Foundation in Philadelphia as an initial step toward developing a Unicode proposal for alchemical symbols. Sample tables are shown in Figure 1, *Explanation of the Chimical Characters* from Nicaise Le Fèvre, *A compleat body of chymistry,* London, 1670, and Figure 2, Basil Valentine, *The Last Will and Testament of Basil Valentine,* 1671. There are many others. In 1928, Fritz Lüdy-Tenger published an inventory of alchemical and pharmaceutical symbols and variants that included 3695 symbols (see Figure 3 for a sample table).

Font resources

Isaac Newton made extensive use of these symbols in his own alchemical manuscripts and the "Chymistry of Isaac Newton" Project has created and expanded an Open Type font, named Newton, with all of the symbols he used to support the online delivery of the alchemical manuscripts through the Indiana University Digital Library Program.

Our project staff members have recently created another Open Type font, named Ludy-Tenger with all 3695 symbols in the Lüdy-Tenger inventory to provide resources for the development of the Unicode proposal.

It would probably require a considerable amount of scholarship and research to identify and organize the entire Lüdy-Tenger inventory and that work is certainly outside the scope of the Newton's Chymistry Project design. Nevertheless we have already created font resources that will enable other interested colleagues and projects to pursue further research and publication.

Basic Strategy

Our basic strategy is to concentrate first on a core group of symbols, perhaps as many as two hundred, that were recognized and organized into tables by European writers working from about 1600, when the first chymical textbooks appeared, up to the publication of the first affinity table in 1718.. It seems reasonable to expect that future projects, publishers, and authors would want to expand the Alchemy Unicode plane as scholarship progresses beyond current frontiers in this area.

The early modern chymical textbook writers already had some awareness of the some of the history of their literature. They recognized the ancient connections made between the planets and naturally occurring ores and metals and carried forward Aristotelian associations with the four elements and vegetative and putrefying processes. Their synoptic symbol tables acknowledged and noted the existence and currency of many alternate symbols and variants for the same substances and processes.

Our Table 2, appended below, sets out the core group of symbols usually included in their synoptic tables and we propose to begin discussion of a possible Unicode Alchemical Symbols plane with these symbols.

Possible Future Expansions of the Alchemical Plane

An important apparent difference between these authors and their predecessors in classical antiquity and the Arabic world was their abandonment of or indifference to ideas like *bile* and *phlegm* and other Galenic or classical medical concepts. Exemplar symbol tables from Greek and Arabic writers did include symbols for concepts in their medical theory. Our early modern textbook writers, however, probably worked in a milieu that was, by then, long influenced by Paracelsus, Vesalius, Fabricius and Harvey. Thus, expanding this preliminary proposal to include the classical and Arabic alchemical symbols would require discussions with friends and colleagues working directly with those traditions.

In 1718, the well-known French Academician Etienne-Francois Geoffroy published a table of "affinities" between various substances that employed the traditional graphic symbols of alchemy, along with a few minor modifications. After 1720, however, the situation quickly became more complicated. Chemists such as Christlieb Ehregott Gellert and Torbern Bergman began devising huge affinity tables to reflect the rapidly expanding knowledge of minerals and of chemicals prepared in the laboratory. As part of those efforts, these new chymical authors began to attempt to modify received alchemical symbols to reflect their new theories. Their graphical solutions were both ingenious and

ultimately idiosyncratic. Extension of the proposed Unicode alchemical plane to include these systems will require the use of combining characters and much careful attention to the details of their respective theories. That work is beyond the scope of what we can contribute without effective collaboration from colleagues interested in those developments. Hence we have chosen 1718, the date at which Geoffroy's affinity table first appeared, as our terminus ad quem.

Newton's Own Modified Alchemical Symbols

Authors working after Paracelsus and before Geoffroy tended to use alchemical symbols primarily as simple substitutes for the written words they stood for. It is common in Latin alchemical texts of this period to find the symbols being declined grammatically, e.g. ♁^{ii}, *antimonii.* It is much less common to find instances in which alchemical symbols were modified or qualified to reflect putative or recognized distinctions or principles in the way that writers of the next few decades would do. In some notebooks, however, Newton notably did modify a number of basic alchemical symbols to distinguish between purified substances and their ores, and between purified substances and their sublimates. Because we are very familiar with these practices in Newton, we are appending a table of those modified symbols for possible inclusion, as Table 3, below.

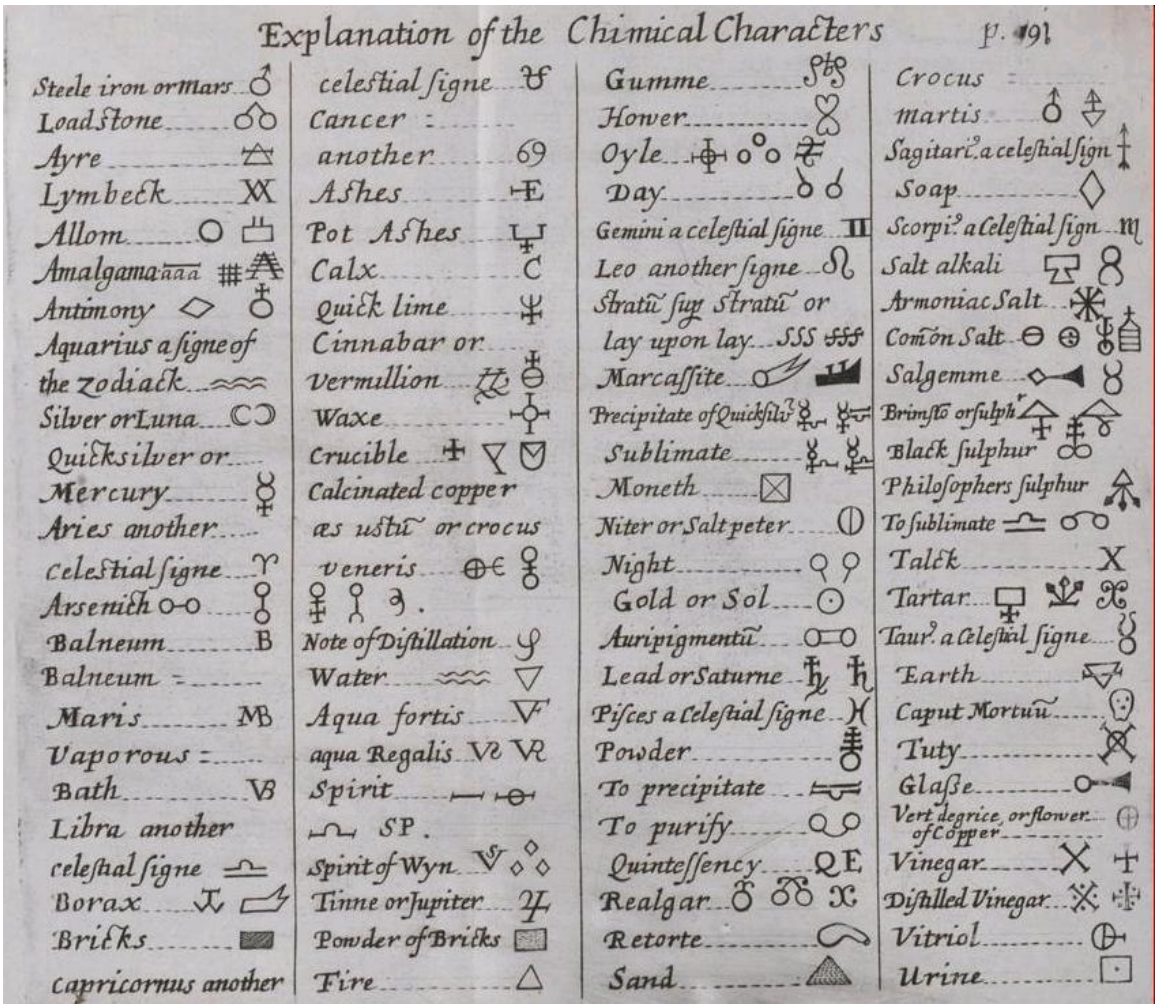


Figure 1. *Explanation of the Chimical Characters* from Nicaise Le Fèvre, *A compleat body of chymistry,* London, 1670.

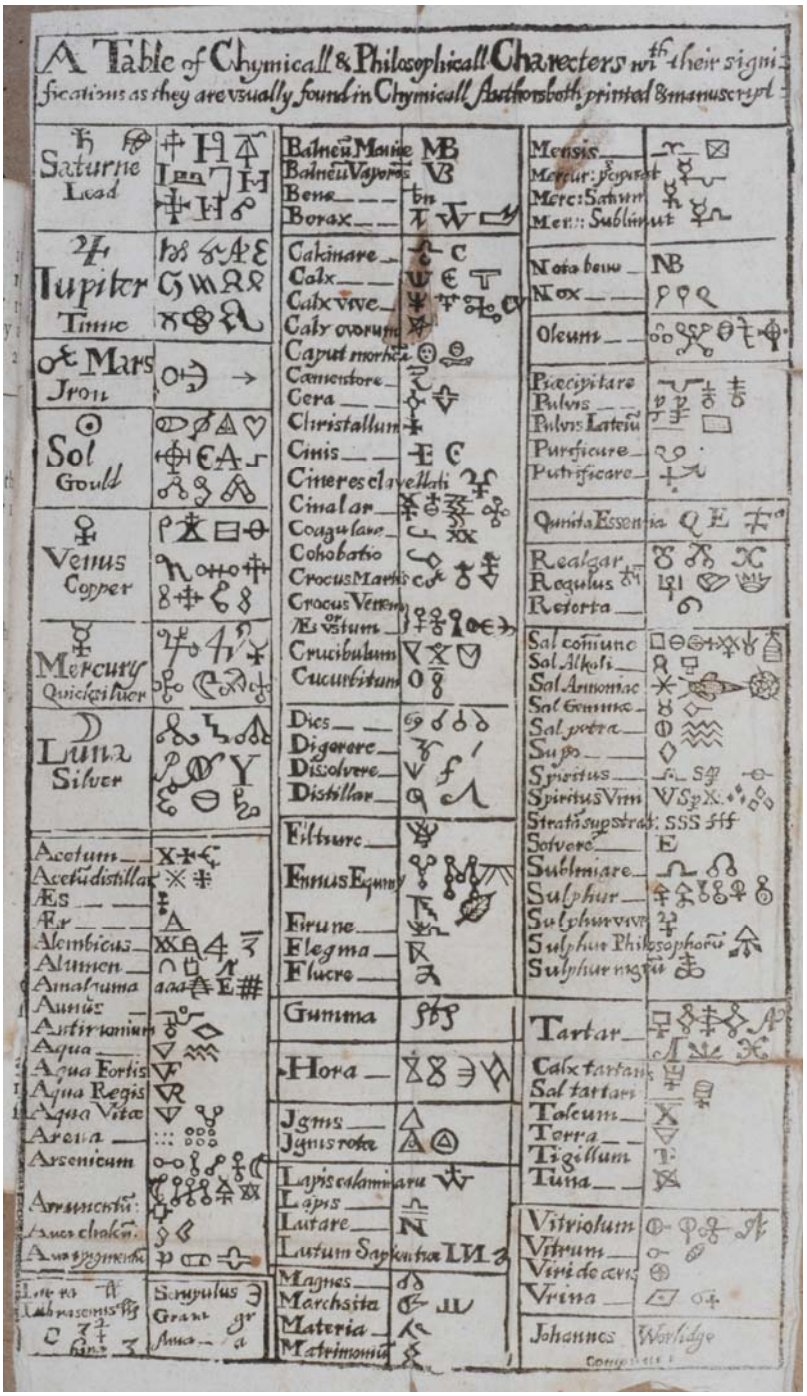


Figure 2. Basil Valentine, *The Last Will and Testament of Basil Valentine,* 1671.

TAFEL 38

	Bolus communis		Sal commune
	Aurum, Philosophus		Calx
	Cucurbita		Lapides
	Calx metallorum		Sulfur
	Lignum		Cerussa
	Autumnus		Antimonium, Calx viva, Argentum vivum, Cuprum, Color roseus.
	Alumen		Antimonium, Color roseus
	Calx ovorum putaminum		Arsenicum album
	Calx		Antimonium spagyr. praep., Argentum vivum
	Crucibulus		Argentum vivum
	Sal petrae, Aphronitrum, Flos parietis, Faex nitri, Nitrum Graecorum, Nitrum stolidum.		Calx
	Acetum		Amalgama
	Retorta		Filtrare
	Vitriolum Romanum		Aqua Mercurii
	Marcasita		Filtrare

Figure 3. Table 38 from Lüdy-Tenger's inventory of alchemical symbols.

Table 1. Existing Coverage of Alchemy in Unicode

Un#	Sym	Symbol Description	Unicode name if different
0292	ʒ	dram	*ezh*
2108	℈	scruple	
2114	℔	pound, *libra*	*lb bar sign*
211e	℞	recipe	
2125	℥	ounce	
2295	⊕	earth; *aes viride*, green copper	*circled plus*
2296	⊖	salt	*circled minus*
22a0	⊠	month, *mensis*	*squared times*
22a1	⊡	urine	*squared dot operator*
25bd	▽	water	*white down-pointing triangle*
25ca	◊	soap, *sapo*	*lozenge*
2609	☉	gold, Sun	*Sun*
260c	☌	day	*conjunction*
263d	☽	silver; Luna	*first quarter moon*
263e	☾	silver; Luna	*last quarter moon*
263f	☿	quicksilver, Mercury	*Mercury*
2640	♀	copper; Venus	*female sign*
2641	♁	antimony	*earth*
2642	♂	iron; Mars	*male sign*
2643	♃	tin; Jupiter	*Jupiter*
2644	♄	lead; Saturn	*Saturn*
2646	♆	bismuth	*Neptune*
2647	♇	copper ore	*Pluto*
2648	♈	Aries	
2649	♉	Taurus	

Un#	Sym	Symbol Description	Unicode name if different
264a	♊	Gemini	
264b	♋	Cancer	
264c	♌	Leo	
264d	♍	Virgo	
264e	♎	Libra	
264f	♏	Scorpio	
2650	♐	Sagittarius	
2651	♑	Capricorn	
2652	♒	Aquarius	
2653	♓	Pisces	
29b6	⦶	niter; *marcasita*	*circled vertical bar*
29d6	⧖	hour, *hora*	*white hourglass*

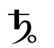
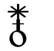
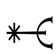
Table 2. Preliminary Unicode Alchemical Symbol Table

Symbol	Description
🜻	*aqua fortis*
🜺	sulfur
🜾	tartar; *lixivium*
🜿	tartar
🝀	oil
🝁	vitriol
🝂	vitriol
🝃	*caput mortuum*
🝄	*crocus martis*
🝅	calcinated copper, *crocus veneris, aes ustum*
🝆	calcinated copper, *crocus veneris, aes ustum*
🝇	mercury sublimate
🝈	mercury sublimate
🝉	copper antimoniate ; *crocus veneris, lapis haematites*
🝊	earth; sulfur
🝋	hour
🝌	night
🝍	day-night
🝎	regulus of antimony
🝏	*spiritus vini; aqua vitae* (impure ethanol)
🝖	*aqua regia*; *balneum arena, lapis armenus*
🝗	crucible with scoria
🝘	*regulus*
🝙	*tigellum*
🝚	*tigellum*
🝛	*tigellum*
🝜	vinegar ; distilled vinegar
🝝	vinegar

Symbol	Description
	scepter of Jove
	lead [unbarred variant]
	trident
	caduceus
	*aqua regia*
	salt of antimony ; cinnabar
	cinnabar
	air
	fire
	tincture
	half dram, *drachma semis*
	half ounce, *uncia semis*
	*sal ammoniac*
	sublimate of mercury [variant]
	sublimate of mercury [variant]
	sublimation
	sublimate ; arsenic
	precipitate; distill
	alembic
	loadstone, *magnes*
	alum
	*aqua vitae*
	arsenic
	arsenic
	auripigmentum
	ashes, *cineres*
	pot ashes, *cineres clavellati* ; alumen
	*balneum mariae*
	*balneum vaporis*
	borax
	borax
	borax

Symbol	Description
	*calx*; *calcinare*
	*calx viva*, quick lime
	crucible
	spirit
	gum
	wax, *cera*
	*marcasita*, marcasite
	brick, *latera*
	powdered brick, *later cibrati, farina laterum*
	crucible
	powder, *pulvis*
	purify
	quintessence
	*realgar*
	*realgar*
	retort
	retort
	*sal alkali*
	*sal alkali*
	*sal gemmae*
	*sal gemmae*
	*amalgama*
	*strata super strata*
	*strata super strata*
	Philosopher’s sulfur
	black sulfur, *sulphur nigra*
	*tutia*, *aes viride*, green copper
	crucible; acid, vinegar, distill, atrament, vitriol, red sulfur, borax, wine, alkali salt, *mercurius vivus* . [Cf. *plus* (002b) but this will probably be a combining character in future expansions of the Alchemy Unicode plane.]

Table 3. Newton's Ore and Sublimation Symbols

	iron ore
	iron ore
	iron ore
	copper ore
	iron-copper ore (probable)
	lead ore
	lead ore
	tin ore
	tin ore
	bismuth ore
	bismuth ore [variant]
	antimony ore
	vinegar of antimony
	sublimate of copper
	sublimate of copper
	sublimate of antimony
	sublimate of salt
	sublimate of salt
	sublimate of salt of copper
	sublimate of antimony
	sublimate of salt of antimony
	salt of copper antimoniate
	starred trident