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Politics and Nationalism in the Naming of Chemical Elements

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Abstract

The naming of chemical elements, whether discovered in antiquity or during the nineteenth and early twentieth centuries or, more recently, artificially produced in laboratories, has typically been politically motivated. Names from geographical entities, such as nation-states, reflect nationalism, regionalism, or municipal pride. Nationalism also plays a role when elements are named for famous people. A new system, designed by chemists to name newly produced elements on a mnemonic basis, is also politically motivated, because it is designed to do away with international squabbles in naming, but it is unwieldy and subject to potential ridicule.

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In a book rather far removed from the realm of chemistry, but much closer to onomastics even though not dealing with it directly, Walter J. Ong states something chemists have known for a long time but names researchers may not have fully considered in the past:

> ... names do give human beings power over what they name: without learning a vast store of names, one is simply powerless to understand, for example, chemistry and to practice chemical engineering. And so with all other intellectual knowledge. (33)

A similar point could be made for medical, architectural, or any number of other nomenclatures. But, as we shall see, chemical nomenclature is rather sui generis. In this instance, onomastics is a bridge between the "two cultures," the humanities and science.

The field of chemistry beats all records as regards the sheer number of names it has to deal with. Organic compounds, for instance, far more numerous than inorganic ones, number anywhere between one and several million items: "Namen für Millionen Individuen," as one German popularizer of chemistry has entitled the section of his book dealing with nomenclature (Rudolph 91). New compounds are being added every day, and each of them has its own specific, precise, unduplicated name.

One chemical onomastic domain is, however, quite different, and more germane to the preoccupations of our discipline. Fortunately, the data are also intrinsically (and essentially) limited in number, and an exhaustive list thereof may well be discussed within the framework of a short article.

I refer to the naming of chemical elements, of which a total of some ninety-two are to be found in nature, ranging from hydrogen to uranium, and increasing in atomic number,[1] in integral units, from hydrogen (1) to uranium (92). In addition, no fewer than seventeen additional ones, known as *transuranic*, have been artificially produced since 1945 in nuclear research laboratories, from neptunium (93) to element number 109, including six that were named very late owing to international rivalries, and international agreement and compromise were necessary to that end. These six names are quite neutral in content and etymologically naive, which underscores the influence of politics.

It is with the onset of the nineteenth century that nationalism and later politics begin to play a role in the naming of newly identified elements.

It all began innocently enough with the practice of the discoverer of a new element having the right to name it, which sounds fair enough. But pretty soon national pride became involved, and pioneering chemists started naming elements in honor of their respective countries, cities, or whatever national geographic or historic features struck their fancies. As Hans Queisser puts it:

> The discoverer of an element is entitled to name it, and at that time of European nationalism a German patriot could only choose the name germanium, to offset the discovery of French scientist Lecoq de Boisbaudran ten years earlier of the element named gallium. (39)

We thus have a certain number of elements whose names are of toponymic origin and are clearly tainted with nationalism. Table 1 is a raw, alphabetical list of these elements.

Some of these twenty names of elements of toponymic origin call for explanatory remarks and comments in the light of politics and nationalism.

Berkelium, a transuranic element, honors not so much the city of Berkeley as it does the University of California at Berkeley, a famous center of nuclear research. It was there that E. O. Lawrence[2] built the first cyclotron in 1934, and his name was given to its famous Radiation Laboratory.

Table 1. Alphabetical list of chemical elements named for geographical entities.

Name of Element	Symbol	Atomic Number	Country, City, or Other Geographical Entity Honored	Year of Discovery
Americium	Am	95	America, i.e. USA	1945
Berkelium	Bk	97	Berkeley, California	1949
Californium	Cf	98	California	1950
Erbium	Er	68	Ytterby, Sweden	1843
Europium	Eu	63	Europe	1901
Francium	Fr	87	France	1939
Gallium	Ga	31	Ancient Gaul (France)	1875
Germanium	Ge	32	Germany	1885
Hafnium	Hf	72	Copenhagen	1923
Holmium	Ho	67	Stockholm	1879
Indium	In	49	India	1863
Lutecium	Lu	71	Ancient Lutetia (Paris)	1907
Polonium	Po	84	Poland	1898
Rhenium	Re	75	Rhine River, Germany	1925
Ruthenium	Ru	44	Russia	1843
Scandium	Sc	21	Scandinavian countries	1879
Terbium	Tb	65	Ytterby, Sweden	1843
Thulium	Tm	69	Thule (legendary Far North)	1878
Ytterbium	Yb	70	Ytterby, Sweden	1878
Yttrium	Y	39	Ytterby, Sweden	1843

Californium, another transuranic element, was honored for the same reason as berkelium. The state of California is thus over-represented.

Hafnium comes from the second half of the Danish name for Copenhagen, i.e. *København* 'port of merchants,' whose Latinized name was *Hafnia*, to which the near-ubiquitous suffix *-ium* was affixed. The element was discovered at the Niels Bohr Institute in that city (Dam 4).

France is also over-represented in various guises: **francium, gallium,** and **lutecium.**

In a fashion similar to hafnium, **holmium** was named by adding the standard elemental suffix *-ium* to the second half of the name of the city of Stockholm 'timber island.' Holmium was discovered by Swedish scientist Per Theodor Cleve, a native of Stockholm; he also discovered **thulium**, thus also honoring the North generally (from *Thule*, the name given by the ancients to the northernmost region of the world (Partington 4: 908. *Thule*, incidentally, was resurrected by the US Air Force for its base in Greenland).

Indium does not belie its appearance of honoring India, but this name does so in quite indirect fashion. Its discoverers were not Indian and had no intention of honoring India. They were Germans. The element was named because of the beautiful blue color, reminiscent of indigo, of its spectrum.[3] And so indium honors India remotely, but pays homage to the color blue. Such chromatic admiration is refreshing.

Polonium, of course, refers to Poland, the native country of one of its discoverers, Marie Curie, nee Sklodowska. As in the case of radium, she has eclipsed her co-discoverer, her husband Pierre, a Frenchman, but then France was already elementally over-represented in 1898 and Pierre showed gallantry (Partington 4: 938). Posterity has compensated him with *curium*.

Rhenium, of hydronymic origin, having been discovered by three German chemists (Partington 4: 91) who named it after the Rhine River (Latin *Rhenus*), leaves one in no doubt that they intended to honor Germany, already honored through **germanium**.

Russia finds itself honored through **ruthenium**, Ruthenia being the Medieval Latin name for Moscow, and also through *samarium*.

Scandium takes its name from *Scandia*, Medieval Latin for Scandinavia. All Nordic countries thus find themselves honored at one stroke (as in *thulium*), showing regional nationalism rather than the more narrow variety. The discoverer was Lars Fredrik Nilson, a Swede.

One single Swedish toponym beats all records of prolificacy in element naming. The site called *Ytterby* 'outer village,' near Stockholm, a feldspar mining center, has supplied the name, in whole or in part, to no less than four elements, all belonging to a sub-group called rare earths or lanthanides (from Greek for "hidden"), both designations emphasizing the immense trouble chemists have had in isolating them because they are not widely distributed in nature. In addition to the obvious **ytterbium**, the second part has yielded **erbium**, the first **yttrium**, and the apparent lack of imagination of discoverers has yielded **terbium**. But it is curious to note that not all the discoverers were Swedes, and not all of those who were Swedes had any connection with Ytterby.

It all started in 1794 with the discovery of a mineral, not an element, a pattern of naming we shall meet again:

> The origin of lanthanide chemistry was the discovery by Swedish Army Lieutenant Carl Axel Arrhenius of an unusual black mineral near the Ytterby feldspar quarry not far from Stockholm. In 1794 Johan Gadolin, a Finnish professor at the University of Åbo, separated from samples of this mineral ... a new and previously uncharacterized "earth," or oxide in

> modern terminology. Although Arrhenius had termed the mineral ytterite, ... Ekeberg in 1797 named ... the earth *yttria*. (Bailar 39–40)

Yttrium,[4] named directly for yttria and thus indirectly for Ytterby, was discovered in 1843 by Carl Gustaf Mosander, a Swedish chemist, who, that same year, according to the *Encyclopaedia Britannica* (under "Terbium"), also discovered terbium and gave it its unimaginative name, although Bailar (41) says credit for discovery (in 1878) should go to M. Delafontaine and J.-C. G. de Marignac, French and Swiss-French respectively).

Ytterbium, a name most directly inspired by the toponym *Ytterby*, was discovered by de Marignac in 1878 (Partington 4: 875). Last, erbium, first discovered in 1843, was verified as a separate element in 1879 by P.T. Cleve, a Swede we have already encountered as the namer of holmium and thulium, who definitely showed a preference for staying onomastically in Scandinavia, and preferably in Sweden itself. By giving no less than three elements names with Scandinavian associations, Cleve shows himself to be self-serving onomastically and politically, and his naming behavior contrasts negatively to that of de Marignac, who, though French, honored a Swedish village.

Let us end the chemical onomastic saga of Ytterby by a passing word about minerals and their names, an entirely different proposition. Suffice it to remind the reader that there are over one thousand of them (see Mac Aodha), though one can hardly expect new geological discoveries in this realm (one exception: the analysis of lunar rocks brought back by astronauts since 1969, a specific subject which I have discussed in a recent article).

A second broad category of "elementonyms" (my phonetically infelicitous coinage from which I instinctively shrink) is of anthroponymic origin. These elements usually do not bear the names of their discoverers, for such conceit would not be countenanced.[5] Most often they bear the names of otherwise illustrious scientists not directly connected with their discovery. The question arises as to whether such an innocuous and even honorable practice, an altruistic one, was or was not tainted with nationalism or politics. One would like to believe that this was never the case, directly or indirectly. We shall see that it sometimes was.

Table 2 lists, alphabetically, all of the elements with anthroponymic names. Mere statistics on such a scanty basis, however sophisticated, would be quasi-meaningless. Only an historical analysis of naming circumstances can shed any light on trends and practices.

Table 2. Alphabetical list of elements named for people.

Name of Element	Symbol	Atomic Number	Person Named for	Nationality	Year of Discovery
Curium	Cm	96	Pierre Curie (1859-1906) Marie Curie (1867-1934)	French Polish	1945
Einsteinium	Es	99	Albert Einstein (1879-1955)	German, Swiss and American (controversial)	1955
Fermium	Fm	100	Enrico Fermi (1901-54)	Italian	1953
Gadolinium	Gd	64	Johan Gadolin (1760-1852)	Finnish	1886
Hahnium	Ha	105	Otto Hahn (1879-1968)	German	1970
Lawrencium	Lw	103	E. O. Lawrence (1901-58)	American	1961
Mendelevium	Md	101	D. I. Mendeleev (1834-1907)	Russian	1957
Nobelium	No	102	Alfred Nobel (1833-96)	Swedish	1957
Rutherfordium	Unq	104	E. R. Rutherford (1871-1937)	New Zealand	1969
Samarium	Sm	62	W. J. von Samarski (1803-70)	Russian	1878

In **curium** Pierre Curie and his celebrated wife Marie, both French (he by birth, she by naturalization through marriage) are jointly honored, and France indirectly. Marie had already directly honored her native Poland through polonium.

Einsteinium, of course, honors Albert Einstein. His nationality, or citizenship, or national identity, remains to this day a somewhat irksome subject to many. He was a native German who disliked Prussia, a naturalized Swiss whom Switzerland hardly ever claims as one of her own.[6] One lone plaque on a Bern street commemorates his presence there, where in 1905 he wrote his revolutionary paper on the Special Theory of Relativity. In 1940 he became a naturalized US citizen, so that America can rightfully claim him, and does, but usually with the added proviso that he was German-born. The Germans themselves, who caused him to flee to America early in the Nazi era and proclaimed him persona non grata, now seem again proud of him.[7] In France he was variously described as "allemand" and "germano-suisse" (not "suisse-allemand"), to further underline his cosmopolitanism, which is unforgivable in France. Seen in this light, the naming of einsteinium by the international scientific community in 1955 (the year of Einstein's death in Princeton) is an additional vindication, if one were needed. He himself stated that he had found peace in America, and America can feel honored by the element einsteinium in a direct way, while the 1921 Nobel

Prize won by the "German-Swiss" (but not "Swiss-German") physicist honored America only a posteriori. And thus does ethnonymy intersect with nationalism and politics as well as science.

Mendelevium was named after Dimitri Mendeleev, a Russian chemist best known for his periodic table of the elements, which paved the way to the discovery of new, predicted elements, as well as to a better understanding of atomic structure. Russia is thus again honored through one of her sons.

Samarium provides a perfect illustration of the proposition that in matters onomastic one should never jump to hasty conclusions on the basis of superficial similarities. A priori, even though improbably, the name of this element seems to honor the toponym *Samaria*, the ancient Israel home of the Samaritans, well known through Jesus' parable of the good Samaritan. But this is not the case, and it turns out that a number of intermediary steps led to this name. Samarium is one of the rare earths and was isolated from the mineral samarskite by the same French chemist Lecoq de Boisbaudran who had honored France with *gallium*. Samarskite, in turn, was named in honor of a Colonel von Samarski, variously described as a mining official, a "mountain official," a mining engineer, or a chemist (depending on the source consulted[8]). Tracing this personal name reveals the Russian meaning (neglecting the German aristocratic particle *von*) "of, from, or pertaining to the city of Samara." But Samara is not only the name of a Russian city, it is also the name of a river (a tributary of the Volga). Russia thus finds herself honored through the man, the city, and the river, all this by a Frenchman who discovered the element samarium and presumably cared little about Samara but very much about the mineral source of his discovery, in a pattern like that of *yttrium* from *yttria* from *Ytterby*.

The naming of transuranic elements has led to such squabbles among chemists and physicists (the latter having taken over in the production of these artificial elements), on political and nationalistic and even ideological grounds, that a compromise had to be found.

I remember how, in 1970, some chemists at the University of Bordeaux, France, who happened to be fashionably left-wing and pro-Soviet, insisted that element number 104 was to be called *kourtchatovium*, in honor of a Soviet scientist named Kurtshatov; this appellation was being bitterly resisted in the US.

The compromise arrived at in this instance, one which also mortgaged the future, starting with element number 101, was a master-

piece of diplomacy but also of blandness and lack of imagination, as well as an etymological hodge-podge. Elements numbered 104, 105, and 106 are now officially called, respectively, *unnilquadium* (from Latin *unus* 'one' plus *nihil* or *nil* 'zero, naught' and *quad* 'four,' plus the compulsory elemental ending *-ium*), all this being a series of juxtaposed Latin words or roots but not a Latin sequence since it rather reflects the colloquial English "one-oh-four" for one hundred and four, too unwieldy in much of speech usage; *unnilpentium*, a similarly built name into which Greek *penta* 'five' creeps after the Latin to create a hybrid for element "one-oh-five"; and *unnilhexium*, a similar Greek-Latin hybrid for element number "one-oh-six."[9]

This system of numeric names of elements has been adopted for all elements numbered above 100. Those which had received traditional-type names (of scientists, for instance) may keep them side by side with the numeric name system, but for those after hahnium, 105, only the new system is allowed. Element number 104, the ill-fated "*kourtchatovium*," became *rutherfordium*, in honor of the illustrious New Zealand-born physicist Sir Ernest Rutherford, a pioneer in nuclear physics. Everyone agreed, but this was shortly before the switch to the politically neutral numeric system was effected. Thus hahnium, named for the German chemist Otto Hahn who discovered the fission of uranium in 1939, effectively closes the onomastic pattern begun in the early nineteenth century.

The new numeric name system is now quasi-universal, and we need not even invoke colloquial English to explain it, as the sequence, consisting mostly of Latin roots but also of Greek ones (a fact which shall be explained below) simply reflects the digits involved in the atomic numbers, e.g. 1, plus 0, plus whatever digit is required. Mutatis mutandis, it reflects in a small way the flexibility of the organic chemical nomenclature, inasmuch as elements as yet unproduced already have their names, and appropriate symbols, waiting for them.

Speaking of symbols, the new system represents another departure from the traditional pattern: for almost two centuries it was agreed that the symbols for the names of elements should consist of one capitalized letter only (usually the first letter of the name), if possible, and one additional letter at most, in lower case, to dispel any duplication and confusion (thus *C* for carbon, but *Ce* for cerium). Thus the strange newcomers could have been given symbols such as **Uq*, **Up* and **Ux*, for instance. But this was not to be: The actual symbols of the numeric system each have three letters: *Unq*, *Unp*, and *Unh*, phonetically and

graphemically reminiscent of grunts by some "prehistoric" character from the American comic strip *Alley Oop*. Presumably the middle *n* was retained to remind everyone of the middle zero of the atomic number. Was this necessary? In the present state of affairs, no, or rather not yet. But the system is quite flexible given the amazing fact that chemists and physicists, acting as latter-day Mendeleevs, are predicting the future production of artificial elements and the system provides for that, in theory at least. At the moment 109 elements are known to exist. Completing the data we get the following list in Table 3.

Table 3. Naming system of transuranic elements.

Number	Symbol	Numeric name (with roots)
107	Uns	Unnilseptium (Latin *septem*)
108	Uno	Unniloctium (Latin *octo*)
109	Une	Unnilennium (Greek *ennea* 'nine')

It can be seen that for 109, using Latin all the way would have meant using *novem*, with the resulting symbol **Unn*, a potentially confusing duplication of the letter *n*, so Greek was called to the rescue. Of course starting with the as yet unproduced 110, the new names would begin with Unun-, one presumes, and this sounds unwieldy. One's head begins to swim when one considers that scientists are predicting the creation of elements up to 168,[10] some even up to 210. One may wonder whether the system will be able to cope after all with just Latin and Greek while avoiding unwieldy combinations. This is the ransom being paid to national/political neutrality.

Some theoreticians actually predict a maximum atomic number "somewhere between elements 170 and 210 ..." (*Encyclopaedia Britannica* 15: 1034).

As of this writing, there are, as we have seen, 109 elements. Let us apply, theoretically, the new numeric name system to just the next few elements to be produced, using only Greek and Latin. One obtains the hypothetical list as seen in Table 4. A masochistic reader may wish to continue Table 4 up to the theoretically predicted element number 168 and beyond, to 210. What emerges even now is the following: Onomastically speaking, the names are (a) underdifferentiated, (b) their symbols

are also underdifferentiated, with duplication, even triplication of letters, (c) the names are unwieldy, and (d) the symbols expose scientists to ridicule, a point which should be elaborated on now.

Table 4. Names of hypothetical transuranic elements.

Atomic number of forthcoming elements	Name to be applied under present system (with symbol)	Roots
110	Ununnilium Uun	*Unus* + *unus* + *nihil*
111	Unununium Uuu	*Unus* + *unus* + *unus*
112	Ununbium Uub	*Unus* + *unus* + Latin *bi(s)* 'twice'
113	Ununtrium Uut	*Unus* + *unus* + Latin *tria* 'three'
114	Ununquadium Uuq	*Unus* + *unus* + *quattuor*
115	Ununpentium Uup	*Unus* + *unus* + Greek *penta* 'five'
116	Ununhexium Uuh	*Unus* + *unus* + Greek *hexa* 'six'
117	Ununseptium Uus	*Unus* + *unus* + *septem*
118	Ununoctium Uuo	*Unus* + *unus* + *octo*
119	Ununennium Uue	*Unus* + *unus* + *ennea*
120	Unbinilium Ubn	*Unus* + *bi-* + *nihil*
121	Unbiunium Ubu	*Unus* + *bi-* + *unus*

While fully granting that the system has great mnemonic value for scientists, let us consider what may happen, especially since the symbols are to be used internationally. Unexpected three-letter words may be produced, with undesirable semantic overtones. For instance, element number 161, if and when produced, will be given the symbol *Uhu*, and a German trademark for glue will be evoked. In America element number 131, *Utu*, will evoke a pun, "you too!," or else the ill-fated U-2 spy plane of the CIA. Number 121 will displease the French, or make them laugh, for it evokes a well known theatrical character from the play *Ubu roi* ("King Ubu"), by Alfred Jarry, and will definitely offend cultivated Poles since Jarry portrays his ludicrous character as a king of Poland. Number 155, *Upp*, will make one think of the adverb *up*, which is innocuous enough, but should it by any chance be chemically possible to combine it with yttrium (admittedly pure speculation on the part of a non-chemist) one would obtain the chemical formula *UppY*, and what red-blooded American would not construe it as a mild obscenity? Number 157, *Ups*,

will make one think of the ups and downs of life, and so on.

And all of the above involves only English, French, and German. Who is to say what unfortunate three-letter words might come up in Finnish, or transliterated Arabic, Urdu, or Japanese? This has actually been a type of serious onomastic problem for many an American business concern marketing its products abroad under an innocent American trademark. And there are thousands of languages. Someone, sometime, is bound to object somewhere! Such a danger was much reduced when only two letters were involved in symbols. Surely this could have been continued, as the possible combinations of letter symbols, taken two at a time from the twenty-six letters of the alphabet, amount to no less than 650 possibilities, from which, by back-formation, some more poetic, or pleasant, or evocative names could have been devised.[11] But of course mnemonics would suffer.

Some signs of unease are already apparent. Following a pattern inaugurated way back in 1871 by Mendeleev, who predicted the existence of germanium but called it *ekasilicon* because of its predicted position under silicon in the appropriate column of his Periodic Table, "Element 113 usually is called ekathalium and element 114 is called ekalead. If they are ever discovered, of course, these elements will be given proper names of their own." (*Encyclopaedia Britannica* 15: 1032). The "superheavy" elements are indeed onomastic bad medicine ... The *eka* prefix, meaning "one" or "one more," is borrowed from the Sanskrit. But if enough "superheavy" elements are produced or merely conceptualized theoretically, such a nomenclature would also run into trouble: Thus future element 163 should be called **ekaekathallium* and 164 **ekaekalead*. The eka system yields onomastic nonsense in the long run, even as a temporary expedient.

I wish to conclude on a lighter, though not irrelevant, note. Scientists, being human, even though academics, will have their little joke once in a while. And so the patterns of naming new elements have been recently jocularly applied to a criticism of academic institutions and establishments everywhere. This was done through the device of imagining the discovery of a "new element" named *administratium*. Many an academic reader, no matter what his field of endeavor, will readily recognize the satirical intent:

> The heaviest element known to science was recently discovered by University physicists. The element, tentatively named Administratium (AD), has no protons or electrons, which means that its atomic number is 0. However,

> it does have 1 neutron, 125 assistants to the neutron, 75 vice-neutrons. This gives it an atomic mass number of 312. The 312 particles are held together in the nucleus by a force that involves the continuous exchanges of meson-like particles called memos.
>
> Since it has no electrons, it is inert. However it can be detected chemically because it seems to impede every reaction in which it is present. ... [12]

And so on. Any further comment would be superfluous, but let us add that the pseudo-announcement, entitled "New Element Discovered," is "signed": "(Author unknown)." Satirical, yes; but not foolhardy he!

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Notes

1. The reader is reminded that the atomic number refers to the number of protons in the nucleus of the atom of the element. An element may also be referred to, as regards its atomic number, as "element number such-and-such".

2. The editor of this journal points out with pride that E. O. Lawrence was a 1922 graduate of the University of South Dakota.

3. A common dictionary ascribes the name to the color of the spectrum of indium (Webster), while the great historian of chemistry, J. R. Partington, sheds no light whatsoever on the name of the element, barely mentioned at all on (899). The *Encyclopaedia Britannica*, 1985 edition, states under the entry "Indium" (6: 264) that the name is due to the "predominant indigo spectral line."

4. Partington, in a table, confuses the rare earth situation by inexplicably using *Yt* instead of the accepted symbol *Y* for Yttrium (4: 909).

5. There are literary exceptions. A French example may be found in one of the famous *Tintin* albums (Hergé's *L'Étoile mystérieuse*) in which an astronomer, Professor Calys, also deals with a fallen meteor made up of a new "element" which he christens *calysthène*, a pleasant Greek coining (cf. English *calisthenics*) meaning "good/beautiful strength" (for it has the interesting biological property of causing plants or animals to grow to gigantic proportions). Here the standard *-ium* ending has been replaced by *-thène*, perhaps on the analogical model of *tungstène*, or even the organic chemical suffix as in *benzène*, or, better, *penthène*. (Cf. the situation in Astronomy, where comets, for instance, may bear the name of their living discoverers). The English version is entitled *The Adventures of Tintin, The Shooting Star* (translated by Leslie Lonsdale-Cooper and Michael Turner). The translated comic strip is of direct onomastic interest: Professor Calys becomes Professor Phostle, and the "new element," fully identified by its discoverer/namer as a "new metal" as well, becomes of course *phostlite* (15). The translators did not stop to think that *-ite*, in English, is a suffix used for minerals, not elements, old or new. The English name of the old astronomer, *Phostle*, suggests the unflattering "Fossil," a rather cruel and silly rendition of *Calys*, whose French homonym is *calice* 'chalice,' suggesting at most a Catholic allusion, quite in keeping with Hergé's ideology, in addition to the positive Greek meaning "good, beautiful." There might also be a bilingual allusion to the luminous shooting star, i.e. Greek *phos* 'light' and English *lite* for "light." An altogether poor rendition.

6. As a youngster, between the ages of ten and fifteen, I lived for five years in both German- and French-speaking Switzerland and never heard even once, whether in or out of schools, Albert Einstein mentioned as a subject of national pride, even though he had won the Nobel Prize in physics as far back as 1921).

7. E.g., Fuchs calls him "ohne Zweifel der scharfsinnigste Denker unter den Schöpfern des physikalischen Weltbildes unseres Jahrhunderts ... "(104). (My translation: "doubtless the most perspicacious thinker among the creative minds of the world view of Physics in our century.")

8. For instance, *Bolšaja Sovietskaja Entsiklopedia* [*The Great Soviet Encyclopedia*], under the entry CAMARCKIIT (samarskite) describes him as a "mountain engineer" (22: 531). The German *Brockhaus Enzyklopädie*, similarly describes him as "Bergbeamten W.J. von Samarski" (16: 404). The French *Grand Dictionnaire Encyclopédique Larousse*, describes him as a "minéralogiste" (9: 9296). It is noteworthy that the *Soviet Encyclopedia* has no biographical information other than stating that his full name was W.J. Samarski-Bikhovts and that he lived from 1803 to 1870. It neither gives him his title of colonel (not necessarily military, but under the Czarist system also a civil service rank), nor his aristocratic *von*. He is not even listed in his own right, in any entry by name (only under CAMARCKIIT), presumably because he was Russian and Czarist rather than Soviet, or at least not revolutionary. Chemistry has thus saved him from oblivion through *samarskite* and *samarium*.

9. The year of discovery is given as 1978 in *QUID 1988*, under the entry in the table of elements: "Elément 106" (253). Before concluding that the numeric name system went into effect after 1988, one should note that the 1980 *Dictionnaire Hachette* already mentions *unnilhexium* and briefly explains the new system (xxiii). The fact that on the one hand the new system is applied to element number 106 six years after its discovery, suggesting that it went into effect sometime between 1975 and 1980, but that a 1987 source does not seem to have heard about it, simply further illustrates the confusion surrounding this whole subject, as regards the range of information available to a non-chemist public, and even to chemists.

10. This is according to an authoritative article last year in *Chemical and Engineering News* (Kauffman). The cover of that issue, featuring a stylized Periodic Table of the Elements, allows one either to see directly or to deduce the symbols for elements 107, 108, and 109, with 110 mentioned by number but blank, since it has not yet been produced. In the article we learn that 107 through 109 were synthesized by researchers of the *Gesellschaft für Schwerionenforschung* (Heavy Ion Research Laboratory) in Darmstadt, Germany, in 1981, 1984, and 1982 respectively. Both Russian and German scientists are trying hard to discover 110, the Russians claiming success, the Germans not acknowledging same as of the date of publication of the article. Precise, predicted properties of further elements are given, up to the apparent maximum conceivable of 168 (Kauffman 29). In other words onomastic problems treated above are just about to begin. Kauffman sounds an interesting note of caution: "Because of nuclear instability ... the synthesis and identification of these 'superheavy' elements will be extremely difficult or impossible" (29). So even the "impossible" elements are provided for onomastically in advance. This is science. But what is to stop a science fiction writer from going beyond that and imagining, say, element 222, with the "right" name "bibibium" and the appropriate symbol *Bibibi*? Everyone would have a problem ... And our friend Alley Oop might conceivably be referred to as *Alley 885* without infringing on copyright laws.

11. Of course the 105-odd single or double-letter symbols already extant, up to and including *Ha* for hahnium, would have to be subtracted from this total, but 105 is such a small figure compared to the total number of combinations that it in no way detracts from the proposition that there was no reason to do away with the old system, which could have taken care of hundreds of new elements if such existed, let alone a few dozen. In that event chemists would run out of anthroponymic or toponymic names long before they ran out of two-letter symbols.

12. While a chemist's satire is welcome, this one is not immune from criticism on his own professional grounds, to wit: (a) The two-letter symbol, *AD*, given this imaginary and funny element, consists of two successive capitals, a sin against terminological and symbolic rules; (b) given the 1990 date of this jocular announcement in *SEAC Communications*—the acronym stands for "Society for Electroanalytical Chemistry," an organization based in West Lafayette, Indiana—the numeric system should have been used, but then all the humor would have been impossible. Beyond the jocose mood the sheer choice of the old system would seem to point to its being deeply rooted still in chemists' minds, invading even a "new element." The author could have "updated" his joke by adding a remark such as "alias triunbium," satire consisting in a good mix of truth and fantasy, a situation Kelsie Harder has always been in a good position to appreciate: eagle-eyed for truth and tolerant of deviations if clearly identified as such.

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