NEW ELEMENTAL VISTAS

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In recent decades, physics and chemistry have been active in contributing new words and names to the English word-stock - a fact for which logologists are duly thankful: the more words there are for them to use, the more they can accomplish. Playing only a very minor role in the overall picture have been new names for chemical elements, since progress in discovering or creating additional elements is excruciatingly slow. For quite a number of years, the number of elements with firmly established names has stood at 103, the elements involved spanning the range from HYDROGEN (element 1) to LAWRENCIUM (element 103).

Unbeknownst to the general public and to most logologists, there is an immensely greater number of current element names outside that range than within it. Since the logological attributes of the hordes of other names have yet to be investigated, the purpose of this article is to acquaint readers of **Word Ways** with the elemental riches waiting to be explored.

There are three groups of additional element names. The first is a set of names for element 0 or zero, more commonly thought of as the nonelemental neutron, a subatomic particle found in the nuclei of most atoms. The 4th Edition of Hackh's Chemical Dictionary (New York: McGraw-Hill Book Company, 1969), revised and edited by Julius Grant, defines NEUTON (not "neutron") as the theorectical zero element, having atomic number 0 and mass number 1. Since no other dictionary, whether general or chemical, seems to list that word, my curiosity regarding its source was piqued. I eventually, and serendipitously, found the word NEUTON in a Letter to the Editor published on page 23 of the January 7, 1933 issue of the journal Nature. The letter was from William D. Harkins, a chemistry professor then at the University of Chicago - one given to putting speculative ideas into circulation, in the hope that some of them would catch on, making him famous. In his letter, Harkins mentioned several other possible names for element zero: NEUTERON, NEUTRONON, and NEUTRONIUM. Others had suggested these alternate names to Harkins, but he preferred NEUTRON for its simplicity and for its -ON ending, consistent with the -ON endings of all the chemically indifferent noble gases, to which element zero would belong.

Comprising a second group of additional element names are those for elements 104 and 105. These two elements were discovered, independently of one another, by both American and Soviet scientists.

The Americans named them RUTHERFORDIUM and HAHNIUM, respectively; the Soviets, KURCHATOVIUM and BOHRIUM. Because no official decision has ever been rendered concerning which set of names to adopt, a third set of names for these two elements has remained in use: EKAHAFNIUM (element 104, in the 1973 Barnhart-Steinmetz-Barnhart work, A Dictionary of New English 1963-1972, London: Longman Group Limited, 1973) and EKATANTALUM or EKATANTALIUM (element 105, in the Flerov et al. article identified below). These are names of the sort that have been conferred on elements the existence of which was predicted by the structure of the periodic table of the elements but which had not yet been confirmed either in nature or in the laboratory. Logologists have always been keenly appreciative of EKA- element names, since EKA- and its vertical sequel DVI- are both combining forms of Sanskrit origin.

There is an interesting footnote to the Soviet name for element 105. I have obtained a copy of the translation by Earl K. Hyde of an article in the Proceedings of the International Conference on Heavy Ion Physics - a conference held in Dubna in the Soviet Union from February 11 to February 17, 1971. The article, "Spontaneous Fission of Isotopes of Kurchatovium and Nilsborium," by G.N. Flerov, Yu.A. Lazarev, Yu.V. Lobanov, Yu.Ts. Oganessian, and S.P. Tretyakova, refers to element 105 as NILSBORIUM, both in its title and in its text. Why articles in English-language science magazines have transformed NILSBORIUM into BOHRIUM is a mystery to me.

Comprising the third and largest group of additional element names are those presented in an article on pages 381-384 of Volume 51 (1979) of Pure and Applied Chemistry, a journal published by the Pergamon Press Ltd. in Great Britain. The article is by J. Chatt, Chairman of the Commission on the Nomenclature of Inorganic Chemistry, Inorganic Chemistry Division, International Union of Pure and Applied Chemistry. Entitled "Recommendations for the Naming of Elements of Atomic Numbers Greater than 100," the article presents the rules for giving newly-discovered elements with numbers ranging from 101 to 999 what Chatt chooses to call systematic names, distinguishing these from the trivial names in general use. HYDROGEN and LAWRENCIUM are examples of trivial names. I like the sweeping grandeur of Chatt's vision, extending the element name list all the way to 999, for I have never seen a scientific opinion that elements beyond 250 or possibly 300 could ever be synthesized in the laboratory.

The new nomenclature rules, approved by the Commission in 1978, convert the atomic numbers of elements into verbal names by replacing each digit of the atomic number with a literal particle, as follows:

0 = nil	3 = tri	6 = hex	9 = enn
1 = un	4 = quad	7 = sept	
2 = bi	5 = pent	8 = oct	

These particles are combined to represent the element's atomic num-

ber, and followed by the termination -IUM to complete the element's systematic name. If the final I of BI or of TRI occurs immediately before -IUM, it is omitted. If the final N of ENN occurs immediately before NIL, it is likewise dropped.

As examples of what the full list of new element names looks like, Chatt provides the following sampling of the full list:

101 unnilunium	121 unbiunium
102 unnilbium	
103 unniltrium	130 untrinilium
104 unnilquadium	140 unquadnilium
105 unnilpentium	150 unpentnilium
106 unnilhexium	160 unhexnilium
107 unnilseptium	170 unseptnilium
108 unniloctium	180 unoctnilium
109 unnilennium	190 unennilium
110 ununnilium	
111 unununium	200 binilnilium
112 ununbium	201 binilunium
113 ununtrium	202 binilbium
114 ununquadium	
115 ununpentium	300 trinilnilium
116 ununhexium	400 quadnilnilium
117 ununseptium	500 pentnilnilium
118 ununoctium	
119 ununennium	900 ennilnilium
120 unbinilium	

In this scheme of things, element 999 acquires the systematic name ENNENNENNIUM. It seems inconceivable to come so close to the magic number 1000 and stop just short of it. I propose the name MILLENIUM for element 1000 - the millenium will surely be at hand when scientists succeed in producing element 1000 in the laboratory!

Professor Chatt, of the Agricultural Research Council Unit of Nitrogen Fixation at the University of Sussex in Brighton, proposes three-letter symbols corresponding to the new element names, each symbol consisting of the initial letters of the numerical roots constituting the name it represents. Thus, the symbol for element 108 is Uno; for element 201, Bnu.

Observe, if you will, that the new nomenclature provides systematic names, in a retroactive sort of way, for mendelevium, nobelium, and lawrencium - even though these elements already have officially accepted trivial names. It also adds another two names to the potpourri of names for elements 104 and 105. We therefore have a surfeit of riches for those two elements - four names for element 104 and six names for element 105.

Chatt's systematic element names have not gone unnoticed in the world of lexicography. Webster's Ninth Collegiate Dictionary (1983) includes UNNILQUADIUM, UNNILPENTIUM, and UNNILHEXIUM, defining these words by referring the dictionary user to its list of chemical

element names. UNNILQUADIUM and UNNILPENTIUM are, indeed, found on that list, but UNNILHEXIUM is not - the latest Websterian error.

I feel certain that every logologist will be just as exhilarated by the sight of all these new element names as I was when I initially spied them. The first task, as I see it, is to find perfect transposals of each name. I have started the ball rolling by transposing NEUTON both into UNTONE and into NUTONE. The ball is now in <u>your</u> hands!

MOTTOES

Published in 1986 for $75, this is the latest in Gale Research Company's exemplary series of specialized reference books. Edited by Laurence Urdang and Celia Dame Robbins, it contains more than 9000 mottoes arranged in 345 thematic categories, from Ability and Acceptance to Worthiness and Zealousness. Not surprisingly, virtues rather than faults are emphasized, with mottoes relating to Divinity (443) or Divine Guidance (454) outrunning all others. Also, there are special collections of School Mottoes and Local Government Mottoes without regard to subject.

This book is fun to browse in. Some mottoes are clever family puns, such as Tout zèle ("all zeal") for Touzel, Sumus ("we are") for Weare, or Perforatus ("bored") for Board. Others are simply inscrutable, such as Ye Great Pule (not with a bang but a whimper?) or Qui Non Cincona Tigris ("he who is not a stork is a tiger"), which sounds like advice from a Chinese fortune cookie. Some confuse: I Make Sicker is not the motto of a quack, but Scots dialect for "I make secure".

I missed, however, one of my favorite mottoes, attributed to Einstein and carved on a stone mantlepiece in Fine Hall at Princeton University: Der Herrgott is Raffinert, Aber Böshaft ist Er Nicht (God is subtle, but he isn't mean).