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MORE ABOUT THE "GOLDEN RATIO" IN THE WORLD OF ATOMS

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In an earlier article (The Fibonacci Quarterly, Issue 4, 1963) the author reported some fundamental asymmetries that appear in the world of atoms.

It has been stated in this article that the numerical values of all these asymmetries approximately are equal to the "golden ratio" ("g. r. ").

Two of these asymmetries were found:

1. In the structure of atomic nuclei of protons and neutrons, and
2. In the distribution of nucleons in fission-fragments of the heaviest nuclei appearing in some nuclear reactions.

Recent theoretical studies suggest that an element containing 114 protons and 184 neutrons may be comparitively stable and therefore this hypothetical substance could be produced possibly in some nuclear reactions [1].

One possible reaction involves bombarding element 92 (uranium) with ions (atoms stripped of one or more electrons) of the same element 92, which should yield a hypothetical compound nucleus ${}_{184}[x]^{476}$ that could break up asymmetrically and produce a nucleus with 114 protons:

$${}_{92}U^{238} + {}_{92}U^{238} \rightarrow {}_{184}[x]^{476} \rightarrow {}_{114}[y]^{298} + {}_{70}Yb^{166} + 12n;$$

12 neutrons (n) would be left over from the reaction [2].

Remark: Both hypothetical (with no names) products of this reaction are designated with the symbols [x] and [y] respectively.

It turns out that the ratio of 114 protons and 184 (298 - 144 = 184) neutrons of the hypothetical element 114 is equal to 0.6195 and differs from the "g. r. "-value (if we limit the "g. r. "-value to four decimals behind the point) by 0.0015 only.

[Continued on p. 249.]