

Stanley's Atomic-Drive Propulsion Unit...continued...you will recall from the last time that Norm Stanley suggests a drive composed of two masses of U-235, both of which are below critical mass, but whose sum is greater than critical. The distance between the masses is important, and with one mass cylindrical and shaped with a concave, focussing face, and the other mass with a doughnut-shaped hole in the center, it might be so arranged that the disintegration products would go blasting through the hole in the "doughnut". Norm continues: "Probably the idea's impracticable as an objection, aside from the lethal amounts of radiation produced, would be the limitations on the size of the individual propulsion unit, since neither of the two masses could exceed the critical mass, which appears to be somewhere between one and ten pounds. However, let's try making a few rough calculations anyway, and see what we get:

First, how much energy do we get from the fission of U-235? It's rare that the fission of a single U-235 nucleus releases 200 million electron volts (200 Mev) of energy. An atomic weight of U-235 would, of course, be 235 and would contain  $6.06 \times 10^{23}$  nuclei; and 1 Mev equals  $1.60 \times 10^{-6}$  ergs. So the energy from the fission of 235 grams of U-235 would be:

$$6.06 \times 10^{23} \times 200 \times 1.60 \times 10^{-6} = 1.94 \times 10^{20} \text{ ergs}$$

This is a lot of ergs, but if the U-235 could be completely converted into energy, the annihilation of 235 grams would give by the  $E=Mc^2$  formula

$$E = 235 \times (3 \times 10^{10})^2 = 2.115 \times 10^{23} \text{ ergs}$$

This is a little more than 1000 times the amount liberated by fission. This checks with the statement in the Smyth report that in fission the amount of matter actually converted to energy is 0.1% of the total amount which fissions. The other 99.9% are the fission products, which in our proposed rocket would be shot off to provide the "kick".

Now what would the "exhaust velocity" of these fission products be? If we assume that all the energy released appears as kinetic energy of the fission products and neglect the relativistic increase of mass at high velocities, we can get, by the formula for kinetic energy,  $E = \frac{1}{2}Mv^2$  solved for  $v$

$$v = \sqrt{2EM} = \sqrt{2 \times 1.94 \times 10^{20} \times 235} = 30.2 \times 10^{10} \text{ cm./sec.}$$

This is approximately ten times the speed of light. And, of course, according to the theory of relativity, as we neglected the relativity correction. The calculation does show, however, that the actual velocity attained would be fairly close to the speed of light, as the relativistic mass increase only becomes appreciable as that velocity is approached. And, also, not all the energy appears as kinetic energy of the flying particles; furthermore, there is also a wide velocity range involved, with lighter particles moving faster than heavier ones. The electrons emitted would probably be close to light-speed, and the neutrons, too, probably over 100,000 miles per second. What we're interested in, though, are the heavy fission products, of about half the weight of the original substance.

The Smyth report doesn't state their velocity; Hawley and Leifson, in their book, Atomic Energy in War and Peace, estimate it to be around 150,000 miles per second, which sounds like a wild guess; Campbell, in the Air Trails, is more conservative, and has them loafing along at a mere 50,000 miles per second. For my calculations here I'll still more conservative and give them the same velocity as that of the alpha particles from radium -- 10,000 mps.

So now let us examine the behavior of a rocket whose exhaust has a velocity of 10,000 miles per second.... (To be continued next week)

Derleth reviews The Collected Writings of Ambrose Bierce. "Ever since his unexplained disappearance and presumed death in 1913, Ambrose Bierce has emerged as a literary figure of mystery, admired for his wit, his tales of the macabre, his cynicism. At least two of his collections of stories -- 'Can Such Things Be?' and 'In the midst of Life' -- have always been much sought after by collectors of the macabre." (The former book is one of the prize-choices in the Emberace now going on - ed.)

The definition of history. "An account mostly false, of events mostly unimportant, which are brought about by rulers mostly knaves, and soldiers mostly fools."

"No other writer has so memorably succeeded in combining horror and macabre humor." August Derleth writing in the Milwaukee Journal, Dec. 29.

Bob Tucker chosen as Honorary Member of the International Mark Twain Society, of St. Louis, for his contribution to literature. Bob says no one seems to have heard of this society.

#### Plans

Phil Schumann and your ed will have a sort of a combozine out in two wks or less. It will be his Psycho #5 & my TH #2. This zine, ditto'd, and about 20-25 pages, will sell for ten cents. If you want some off-trail reading along Frontier lines, try it.

Ron Maddox and Ron Christensen plan a 5 page, bi-weekly, newsie The Fan Speculator, to sell for 4¢ or 7 for 25¢.

William Roteler, to edit Neophyte, says the 'dagger' on his letter-head is a sword. A new design will show a rocket of the same size. William would like to see some material for his new zine.

Bob Stein and Redd Boggs and Tom Jewett appear to be planning a joint Fantasy Illustrated.

Technocracy and Semantics in a letter from Henry Klener, Jr.. "You might be interested in the following from a letter I rec'd from R.B. Langan, editor of The Great Lakes Technocrat. 'Now, it is possible we may be able to get something in the Question Box on the subject ((semantics)). In a Technate there is no doubt that semantic training will be given to all. At least, the hogwash of abstractions will be whittled down a great deal.'

"Technocracy and semantics are compatible in that Technocracy, being a scientific body of thought, does not employ abstract concepts. It uses only operational concepts. However, the professional semanticist advances semantics as a sovereign remedy for individual and social maladjustments and ills in almost every department of life. This is carrying a good thing too far. If the Price System can be conjured into a non-Price System of technological social controls with production for distribution, with abundance, security, equal opportunity, balanced load, full load operation, revision of the calendar, etc., as outlined in the synthesis of Technocracy, merely by the widespread use of semantic voodoo, then all well and good. In that case, we'd better all go back line and sinker for semantics."

H.S. Richardson says that Mr. Stanley will probably find most of the answers to his questions about E. Wood, the physicist who helped Arthur Train write that fine 1914 The Man Who Rocked the Earth, in Doctor Wood by William Seabrook, published by Harcourt Brace in 1941. A sequel to the above story was published a few years later in Cosmopolitan magazine. It was called The Moon Maker. It seems considerable squabbling occurred between Wood and Train over the credit each should receive and division of the spoils generally. Wood himself is the author of a little book of nonsense poems entitled How to Tell the Birds from the Flowers.



Recent Arrivals from the Fan Press....

The Scientist, Jan, 10¢, from  
Henry Elmer, Jr., 13518 Cedar Grove,  
Detroit 5, Mich. Contains an inter-  
esting article by Joe Kennedy on 'U-  
-plane Made to Order', and other in-  
formative material worth the price.  
Recommended.

Reading in the Dust, 3/10¢, from  
Ray Rehn. Unusual art and decorations  
in the material is rather frothy.

The Pocket Book of Robert Frost's  
Poems, 30¢, PPSF Bulletin, Fantasy Times  
134. Ember recommends that, if it's  
news you want, get one or all of  
these and you won't be disappointed.  
Ember is not particularly interested  
in surveying news as such, but rather  
your reactions and views on the way  
that news efforts.

Arkham House Bulletin, Jan., from Sauk  
County, Wis., contains typical Derleth  
excerpts of AH plans and troubles.

Don Bratcher says "By the way, I redis-  
covered the book on parapsychical vision;  
It's Eyeless Sight, by Jules Romains  
(Gaston Parigoule), originally written  
in French but there exists an English  
translation by Charles Kay Ogden.

Since Ember's inception there has  
been no greater reaction of you Em-  
ber readers to anything so far printed  
than to Derleth's criticism of the  
Kennedy poll. Space, this issue, is  
not elastic enough to squeeze the re-  
buttal in, but next ish will feature  
all your replies.

Redd Boggs writes a hurry-up defense  
of the fair Tigrina. "Chivalry from  
me to take exception to Derleth's  
remarks about Embereviewer Tigrina  
and her opinion of "The Clock Striking  
Twelve". The fact that one of the  
stories that she regards as second-  
rate were included in The Night Side  
and The Sleeping and the Dead merely  
proves that tastes differ, and that  
anthologist Derleth-Grendon, who chose  
the tales for both books, hasn't  
changed his opinions regarding them.  
I note that Sam Moskowitz pans "The  
Bell and One Other" in the Fall "Fan-  
tasy Commentator", but that "The Bell"  
-- will be in one of the anthologies.  
Does that prove that, like the In-  
Tsen of Shangri-la, Sam isn't suf-  
ficiently in the know to make a good  
reviewer?"

The Pocket Book of Robert Frost's  
Poems, now out, contains two top-notch  
fantasy poems: The Witch of Coos  
and Ghost House -- Boggs.

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(not matter only)



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