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COMMENT

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EDITORIAL

Any resemblance between this publication and So Saari will be purely coincidental. The only thing I expect to retain from that effort is the small size. Please understand, brevity isn't a thing aimed at by the publisher, nor does it follow from thrifty motives, nor from lack of article material and ideas. I have a lot more material in a state of semi-completion than will ever see mimeo in the pages of this issue. The time allowed after Xmas for completing the stenciling has been gobbled up by Buick Motor, whose staff of Simon Legrees has had this poor drudge pushing pencil at the rate of 71 hours per week.

The last mailing made interesting reading, but I won't attempt to make complete reviews this time since they don't seem to be in style. Of course I read each and every one of the publications (except the poetry) thoroughly and have notes on my impressions of most of them. However, comments will be made blithely from memory, on things half-remembered, such as.....

Milty Rothman's mention of some work by R.D. Swisher on the equations of vertical rocket flight in an inverse square gravity field. Praise Allah! I have a few notes devoted to that subject myself....But perhaps I had better first defend the act of putting discussions like the following into FAPA mailings. I know there are some members who will be interested, and others who will not. But I'm sure these others are provided with the usual mechanisms in their minds which will allow them to glide smoothly over stuff like this, leaving not a scratch, not an impression, and I trust that these persons will forgive me for this one "blank" page if they find anything of interest in the pages following.....

Willy Ley, as Milty says, uses engineering approximations in his book on rockets, and is, I believe, using Oberth's methods when he determines velocities obtainable in free (gravitationless) space for given fuel ratios -- the equations for free space are easy to determine -- and then applies these velocities as if they were initial velocities at the earth's surface, and the rocket flight to be determined as similar to that of a free projectile shot from a gun at that velocity. To anyone acquainted with the calculus, or even with solid common sense, this is totally inadequate to describe the vertical flight of a rocket which is being continuously propelled and whose mass is continuously changing in a retarding gravitational field which varies inversely as the square of the distance of the rocket from the center of the planet. Ley's assumptions are all right for working with all known possible rocket fuels, because all of these have to be burned at such a tremendous rate (to get thrust) that the rocket blast couldn't operate for more than a few minutes, after which the ship would be in free flight. But considering ideal fuels, or some other means of ejecting masses at far higher velocities than thermodynamic expansion (we have hints of many possible ways existing) we can conceive a rocket which operates continuously as the ship rises. Now, for such a rocket, approximate methods of calculation wouldn't be sufficient. The true description of the rocket's flight would be expressed by the following differential equation, which considers all the factors save air resistance, and will give you the position of the ship at any time "t" when solved. Which is wherein the rub lies. This poor mathematical drudge is drooling to get a gander at Swisher's Fourteen Pages, for They must contain the solution.

If $V =$ rocket exhaust velocity (a constant)
 $m =$ mass of ship + fuel at any time "t"
 $K =$ constant depending on the radius
and surface gravity of the planet
 $x =$ distance from ship to center of planet

and

$\frac{dm}{dt} =$ rate of fuel consumption

then the differential equations of the rocket's flight can be obtained using the good old dynamic principle $\Sigma F = MA$, which says that the sum (vector) of all the forces acting on a body is equal to the mass of that body times the acceleration. Since the flight is vertical, we needn't worry about vectors. For Case I, let's assume the fuel consumption to be constant at all

times. Then the rocket thrust would be constant. Call it "F" and call the rate of fuel consumption "R". Then,

$$F - \frac{mK}{x^2} = m \frac{d^2x}{dt^2} \dots\dots\dots (1.)$$

To put the equation in solvable form, m is expressed in terms of t, so: $m = m_0 - Rt$, where m_0 is the initial total mass. The equation then becomes

$$F - \frac{(m_0 - Rt)K}{x^2} = (m_0 - Rt) \frac{d^2x}{dt^2} \dots\dots (2.)$$

The only methods I can think of to solve this equation are very tedious and provide only numerical solutions. If solved, the resulting equation would give the position of the rocket at any time, given the starting conditions. However, it's easy to see that if the rocket thrust remained constant while the mass of the ship decreased to a fraction of its original value, the acceleration would increase manyfold, and the occupants would soon be flattened; hence it might be desirable to install a gadget which would regulate the throttle automatically so as to keep the acceleration and not the rocket thrust constant (at some comfortable figure, say 3 g's). Perhaps I should have said the "apparent gravity" instead of "acceleration" here, since I meant not the actual time rate of change of velocity of the ship, but the sum of the effects of that acceleration and that of the changing gravitational field. This is probably the equation our great-great grandchildren, navigating luxury space liners, will have to solve to determine the positions of their ships, just as present day atmospheric navigators use the vector sum of air speed and wind velocity. The force F of a rocket for a variable rate of fuel consumption can be expressed as

$$F = V \frac{dm}{dt}$$

The "total acceleration", which determines the apparent weight of the occupants of the ship, consists of the acceleration of gravity plus the linear acceleration of the ship, thus

$$\text{"apparent acceleration"} = \frac{K}{x^2} + \frac{d^2x}{dt^2}$$

which quantity is now being taken as constant and equal to a constant "E", giving, from dynamics, the following differential equation

$$F = m \left(\frac{K}{x^2} + \frac{d^2x}{dt^2} \right) = mE$$

which yields

$$F_1 = \left(m_0 + \int_0^{t_1} dm \right) E$$

and

$$\frac{K}{x^2} + \frac{d^2x}{dt^2} = E$$

This differential equation is much easier to solve than equation (2) and will give the position of the ship at any time

Of course it must be realized that solution of equation of this type will be of purely academic interest till the first atomic rocket exhausting mass at velocities comparable to those of alpha particles (20,000 Km./sec.) takes off from earth. With such exhaust velocities, and rocket tubes that would stand indefinitely the energied producing them, we'd have interplanetary travel in our vest pockets. And it isn't as impossible as it may sound. Consider, there are many forces acting in the universe which we as yet know nothing about. The sun, for one thing, shoots out flaming masses (prominences) bigger than the earth at speeds expressed in hundreds of miles per second.

Whew! Back to earth agsin. From Solar prominences to fanmags. What have we here? (Yes, you accuracy hounds; I've abandoned memory for some more positive stimulus.) Yhos looks like a nice little mag; wish I could read it.....And Laney asks me a very pertinent question: must everybody be either introverted or extroverted? Seems to me I implied something of the sort. Funny how I've always in my mind divided the world of man into these two classifications without stopping to think of the in betweens. There must be "Jekyll and Hyde" personalities, people who can take a crowd or leave it alone. If we're speaking only of extremes when we speak of introverts and extroverts, they are probably as rare as cases of extreme paranoia or the galloping willies. Yet as far as I've been able to observe, most people do fall into two different types, call them what you will -- each with a different sense of values, and neither of which can understand the other's motives or purposes. Call them "fans" and "non fans" if you like. Every fan knows that fantastic fiction attracts mainly one type of person, and you can usually separate your friends into those who are fans (whether they read s-f or not) and those who are not and could not ever be fans. I like the fans. The others I tolerate when necessary..

Norm Stanley's math department is warming to the heart. Thanks! But Miller's math is a little inadequate, or is that what you were showing me? His first mistake is in the first step -- differentiation of the kinetic energy equation $E = \frac{1}{2} MV^2$ gives $dE = \frac{1}{2}(2MVdV + V^2dM)$ if both M and V are considered variables, which we are told they are. This differentiation makes the problem harder to solve and the results more reasonable.....By the way, Norm -- maybe I said it before -- "Yesterday's 10,000 years is one of the best fan columns I've ever seen. Keep it up. How about quoting from "first letters" of fans now famous -- would make a good article all by itself. I haven't my collection handy here or I'd do it.

And, in conclusion, to the friendly fen who sent me personal letters inspired by my first FAPA entry, my humble apologies. These letters reached me at a time of great unsettlement in my personal existence, and hence were not answered with the snap and gusto the Saari of old would have answered voices from kindred souls; however, they're still on top of the file, they shall be answered!

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A NOTE ON ORIGINS

In the past few decades, scientists have cooked up hypotheses regarding the formation of the planets of the solar system which finally seem to fit all of the observed phenomena. Unfortunately for the science fiction fan, the birth of a solar system seems to require two parents unless the laws of motion are all wet, which doesn't seem very likely. Unfortunately -- because the frequency of the chance approach of two such parent stars seems to be something like once in 1,000,000,000,000,000 years for any given star, and that is a big number even if you were talking about all the observable stars in all the galaxies combined. So science fiction's dream of a galactic empire of many populated planets doesn't even have that meager encouragement from astronomers, that many other planets may exist.

But there seems to me to be a possibility seldom mentioned. How many dark stars are there -- stars which may not be coal black things, but yet are not luminous enough for their light to reach us? Since our only means of observation are optical, there is absolutely no way for astronomers to gather data on this question. There are hints. Of the 19 stars which have been found to be within 13 light years of us, 12 have magnitudes too faint to be seen with the naked eye. And 13 light years is but a small corner of the galaxy. How many more and still fainter stars are within that distance? How many "dark" stars are there in the other reaches of the universe?

Sirius has a dark companion. The light curves of many other variable stars show that they also have dark companion stars. Trillions upon trillions of dark stars could be scattered throughout the galaxy without our becoming aware of their presence, because even then the distances between them and their distances to the visible stars would be too great for them to have any observable gravitational effects. But their presence would certainly cut some zeros from that solar system probability. Perhaps we shall have our galactic empire after all!

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AN S-F FAN GETS RELIGION

Don't touch that dial! This is going to be painless. I'll start with a summary. (The devout and satisfied need not proceed, but I hope there aren't many.)

At first there was nothing. Then God created everything. He created the Earth. But, most important, He created Man. He told Man that his principal interest and concern was to be sin and/or lack of it, and his salvation into an eternal (undefined) good place rather than damnation into a terrible (undefined) bad place. Incidental to these, perhaps with his left hand while shaving, God created the Universe, made it a place vast beyond physical concept, intricate yet colossal in its workings, filled with a change and evolution that began where and aimed at what and ended when it didn't matter because Man and his sin were the only things of importance.

The idiocy of this setup has led many intelligent people throw up their hands and formulate their own philosophies. Even some unintelligent ones, like myself. Yet it has always seemed to me that the fact that the masses of the earth's people still take time out from the daily routine to consider things beyond their everyday existence is a good fact, one which has done much good in the past and can do good in the present. A world with no sort of "spiritual" leadership does not seem to me like a good world. In arguments (futile) with religious friends, I have always conceded this point, and have begged only that the church lay itself open to criticism, to evolution, to the change which is so inherent in everything around us. Anyone who has ever argued the same knows what the reaction is: one is politely told that one is a damn fool for failing to see that, since everything exists, it must have been created, and hence everything that has ever been written in sufficiently vague language about God, the creator, is necessarily true. The church is too much like a closed setup, a political machine which fakes elections and interprets laws to suit itself.

Imagine my surprise, then, on reading a booklet by one Harold Scott, M.S., Th. D., a minister, a pastor of a church. The booklet, practically forced upon me by a friend, is suggestively enough entitled Theological Terms in the Light of Modern Scholarship. At the bottom is a quotation from Lowell: "Time makes ancient good uncouth." Between the covers is some of the most fascinating reading I have encountered. To the devout, this book would be an abandonment of all religion, a preaching of atheism. To me it is the first hint that any congregation calling itself religious could ever be emotionally, intellectually, and spiritually satisfying! Before I'm disowned by many who must feel as I felt before reading this book, I'll copy a few meaty quotations, trusting Dr. Scott won't mind, and let you judge for yourself.

"In our day," Dr. Scott says, "we must have a religion that is intellectually respectable, scientifically valid, and emotionally satisfying.... Today there is a horizontal cleavage running through the traditional American denominations

dividing those who accept the modern scholarship from those who reject it in favor of what was acholarship yesterday."

This, in itself, is startling enough, coming from one who has been educated in theological schools. But he goes on to evaluate what the church considers authority. Religious revelations of the past have always reflected the world view and world knowledge of their time or times. "It is human knowledge and speculation not God knowledge." Dr.Scott goes on to say: "If the Christians of today reject the authority of *a priori* dogmas, church councils, the church, the Pope, the Bible, the ancient creeds, formulae, martyrs, teachers, and bishops, where is authority? Well, authority is in the truth wherever truth may be found.Too long the church has insisted on its dogmas being tried in courts of its own choosing with ordinary rules of evidence excluded, and before jurors of its own selection.....There have evolved certain techniques of precision in testing truth. By this is meant the concurrent use of such approaches and techniques as are relevant to the question in hand, such as the historical or social or genetic approach, gathering of data, inspection, comparison, classification, logical analysis, experimentation, calculation.....To these religion must submit. Through these truth emerges." Also, "There is no such thing as undervived knowledge," and, "Relative to the unknown, humans have little knowledge!"

I am quoting because these are my convictions, stated more concisely and clearly than I could ever say them. I shall therefore quote some more: "Traditional Christian theology greatly exaggerated the cosmic importance of Man..... Man is an animal but a unique animal....a gifted animal. Of all forms the most complete and complex, he alone has the capacity to grasp to any degree the significance of a dynamic environment and to make conscious adjustment to it....Man is still in the kindergarten of the race. He is young yet as a species. As might be expected the immediate attracts his attention. The matter he can manipulate engages his interest and commands his skill. He is primarily a materialistic animal fighting to supply his appetites, and entranced with each visible novelty. The joy of mechanical creation is strong within him.....Man has not yet evolved into the philosophical man. Compared with his mechanical triumphs his progress in religion and in social engineering is pitiful. Only in the field of manipulation of matter -- science and technology -- is he capable of sustained objectivity.....Faced with fundamental problems of destiny, he falls back on sentimental myths and fanciful constructions bearing no relation to the empirical world he investigates so avidly in the service of science and technology....It is by no means a safe assumption that man is necessary to the ends of God. Rather it seems almost certain that if man cannot make continuous and rapid adjustment to the creativity of the moving universe he will become another of the discarded forms and his bright promise forever lost.....Religion is the effort....to read the purposes of the universe and to make adjustment to them. Religion is a sense of direction."

The italics are mine, to make sure you wouldn't miss that last sentence. It contains, in six words, the essence of this article and Dr. Scott's booklet: that there can exist a pursuit which is at once scientific and logical, yet broader than any of the specialized fields of science, a pursuit toward a sense of direction. What is fandom, if not that? Why do fans get together and argue about scientific subjects they know little about, yet feel enough to make progress? Why are stories like Fifty Million Monkeys written? Here we see in fandom and in Dr. Scott's religion a clear similarity of purpose: to observe, in the processes of the universe, evidences of trends, of harmonies, of principles. "Religion is man's response to the totality of his universe." Also, "Religion is not the product of revelation but of evolution. It was not projected into man's world from a spirit world but arose and developed out of man's need. Religion is

implicit in man's nature."

The booklet proceeds to define some of the ancient terms of religion in a modern sense. Look at the definition of sin, stated thus: "The universe exhibits certain definite characteristics....Sin is disharmony of the race or individual with those characteristics. Sin is the lack of adjustment to the evolving purposes of the universe. Since the plan of the universe seems to result to some degree in value, meaning, and appreciation, sin is obscurity of meaning, blunting of appreciation, and opposition to emerging or potential values." In this way, "...probably ministers and whoever write the advertisements are the most sinful among men."

Dr. Scott is a man of fifty or fifty-five, graying hair, looking more like a doctor or the better type of college professor than a minister. His voice is penetrating and slightly cynical, and he has the air of a man sincerely trying to make his meanings clear. His congregation is small, his church small but very warm and nest, and there is not an overdone, unreasonable howling for shekels. Obviously his salary is small.

You might fairly ask what he preaches about, if he omits all the remainder of text and the favorite oratorical mumbo-jumbo of the preacher. The answer is, all sorts of philosophies, from Emerson to Plato, from Kant to Russell, and some obviously his own. This convert has heard a worthy sermon on Emerson's essay on "Self Reliance" and a discussion on the position and importance of minority groups in the world's thought which contained more inspiration in ten words than all the other preacher-talk put together.

All of which just goes to show that not all fans read or have even heard of fantasy fiction, and one finds them in the strangest places!

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BOOK TALK

I recently obtained from a bookstore S.Fowler Wright's Deluge, Dawn, and The Island of Captain Sparrow. Deluge I had read before; the other two I had not, but I read all three within a week. This is good fantasy! Deluge and Dawn are unique among novels, to the best of my knowledge, by being separate accounts of the same characters, theme, and plot -- the struggles of a handful of people left living after a geologic upheaval in which most of the known world is buried under water -- but written from different points of view. Reading Dawn after Deluge is like reading a much-loved book after many years -- you know what is going to happen, but the writing is new and the knowledge only heightens your interest.... Get these, if you haven't read them. They're among the best fantasies ever published in book form.

The Island of Captain Sparrow is just another "lost island in the Pacific" story, but with many points of originality and certainly a writing style that is far from mediocre.....Anyone having knowledge of more of Wright's work, or having other books by him they wish to sell, please communicate with me.

There's a new book out -- "a Wellsian fantasy" says the catalog -- called The War Against the Nests or is it The War With the Nests, by an author of whom I had heard. Dammit, I haven't the catalog handy and can't remember his name, but have ordered the book and if it's any good you'll hear about it next issue.

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