

Dr. Franklin Merrell-Wolf, ①

You probably know some few
externals about us from Frances
Crane who was a secretary in the
department at Columbia University
where I was an associate professor.
The Self within (or is it without?)
certainly knows the deepest
reasons for our decision to
withdraw from that kind of
wordly [sic] life. We are living
in a much improved state
of simplicity, as isolated
winter ~~denizens~~ dwellers
("caretakers") in the Theosophical
society camp on Orcas Island
in Puget Sound. (We are not

I use red ink because my black
ink pen is being repaired.

theosophists in the formal sense —
but primarily aspirants to Recognition.

My wife is a pianist — a very
fine one, and I am a
theoretical physicist by training.
(Ph.D. University of Chicago 1938), and

~~by Karma,~~
a bridge-builder — or better:

boulder-remover from the
bridge that ~~was~~ ^{is} eternally
there — from the relative
to the Absolute. Needless

to say this is mostly
potential or latent, because

I am on the relative side.

My attempts from that side
have that appearance of the
spasmodic and frustrated, which
they must have had if they

were to lead on. I thank God
for that frustration, for it has
finally led me to learn of the
possibility of Recognition.

We would spend the three
months we are taking away
from Orcas, this year, in the
great friendliness of your
proximity. Is it feasible?

We are three - my wife and
I and our happy, delightfully
joyous, little baby son (1½ yrs
old). My wife is to have
another child in the Spring,
(Karma that has "sprouted"!)

but, judging from the past, her
health is robust right up to

the time of birth - so that will
entail no additional complication.

Specifically, can we find a
place to live near you inexpensively
(we have only small savings)
for the months of January,
February and March? 1949

Sophia - my wife - and I
are reading your "Pathways
Through to Space" together
a little every evening. It is
a high point of our day
together. It brings glad
tidings of The Kingdom of
Heaven, and we are grateful
With you,
M. Avramy Melvin

Franklin F. Wolff
San Fernando, Calif.
November 24, 1948

Dear Dr. Melvin:

Your letter has caused me a lot of thought. I gather from your letter that the desire for Recognition led to the decision to leave the university world. It is a course that I know from my own experience, and so feel an especial empathy for the problems you probably are facing. This way has its peculiar difficulties and trials that are unknown to most travelers of the Way. The loss of association with the colleague who comes to look askance at you as probably having lost critical discrimination: Poor fellow; he was so promising, too. The new companions never understand your primary language and thought, though they do have the Spark lacking in the old colleagues. The price, a peculiarly poignant solitude, is quite beyond the understanding of nearly everyone. Yet, I know the sacrifice can be, and ultimately will be, fully justified. There is a Law of the Way which may be paraphrased as: He who would attain the Supreme must offer upon the Altar his best.

Then, too, the artist, the theoretician and the mystic are a strange exotic people in this world. They hold in common an attitude of other-worldliness, though the delineations of the "other world" vary widely. Practical man, he who is best adjusted to this world, does not understand them, often fears them, is forced to respect them, and dimly realizes a dependence upon them. The instinct of the race has led it to build protecting centers for these exotic people, such as monasteries, universities or the shields of individuals of influence and power. He who leaves these places of protection, as the pioneer into the greater depths of Consciousness, must at some time or other face the problems which grow out of the fact that he is rarely well-adjusted to the world of common relations. Only exceptionally is he practical and, therefore, not the natural householder. The problems tend to become rationally impossible. Yet, if he has the courage and faith to face the uncertain, he is most likely to find that the ravens will feed him as they did Elijah.

The culmination of the artist, the theoretician and the mystic (including Buddhas and Christs) may be likened unto the three peaks reaching above the clouds surrounding the world of affairs, the world of politics, commerce, and common social relations. Of these three peaks one reaches beyond the range of all conception and perception. He who would journey from one of the lesser peaks to the greater sees two ways. One is the Rainbow Bridge and the other is the way which descends to the valley to begin a new climb. Man cannot cross by means of the Rainbow Bridge, for only the gods can travel that way, so that to go higher one must first go down. In the valley a stream must be crossed. In this stream hidden creatures dwell, and these must be met and mastered. Then the new climb begins. He who attains the Goal thenceforth may use the Rainbow Bridge. I think you can read the symbolism. Fundamental to *Pathways* was a sudden insight which I subsequently formulated in the rather Newtonian form: Substantiality is inversely

proportional to ponderability. From this we derive readily the equation of the equilateral hyperbola, when asymptotes are taken as bases for reference. As you know, the equilateral hyperbola bears the same relation to the family of all hyperbolas that the circle does to the family of all ellipses, and has corresponding trigonometric functions known as hyperbolic functions.

The ordinary sine or cosine curves are part representations of all periodicity, including the birth-death cycles. But, this kind of cycle is endless and leads nowhere; it can become a quite monotonous treadmill from which, sooner or later, one desires Liberation. Transform the circle into the hyperbola, as by the appropriate projection, and the sine becomes the hyperbolic sine, which ascends above a statement of what is meant by Enlightenment in terms of mathematical symbolism, with the potential of unlocking Meaning by the theoretical approach, rather than by the more familiar mystical empiricism.

The circle is a very ancient religious symbol, actually veiled in the Great Pyramid measurements to the fifth decimal approximation to pi. Here we see the notion of Self as center within. Now, the hyperbola, though usually viewed as an open curve, may be viewed as a closed curve embracing infinity, with the center outside. I leave the rest to you.

I am particularly interested in your "The Nature of Scientific Theory." As I see it, the weakness of our science lies in the infinity of possible theories for the development of generalizations, in the conception of simplicity, as you point out, and in the restriction imposed upon the operational concept that in the prediction of new relations they shall be only such as are confirmable by an individual with the generally common cognitive equipment. These restrictions inevitably bind science to an exclusively pragmatic validity. The result is that this science, however elaborated, can never be more than practically justified, and thus can never be really pure. The point is that once we grant that cognition is, or may be, more than two-fold, then a world-view having only this two-fold base is necessarily ultimately false. If a root-theory could be directly apperceived, then hypothetical postulation would be transcended and pure science would become deduction, hence essentially mathematical. But today we know from our critique of conceptual and perceptual knowledge that on the basis of these two organs alone such direct apperception is impossible. Hence, if we are ever to know truly, a third organ, at least, is necessary. I view Recognition as possible only through the activation of such a third function or organ, one which is generally latent in man. Therefore, Recognition, in addition to being a religiously significant Transformation, is also the precondition of true Science. In an unpublished manuscript I have dwelt at some length on the problem of building a presumption for the existence of this third function and, in opposition to Bertrand Russell, Dewey, Leuba, Coe and others, insisting that mystical Recognition is not solely a transformation in terms of feeling, but, as well, the key to real Knowledge.

Yours very sincerely,

Franklin Merrell-Wolff

Dear Friend,

(2)

Deep thanks for your letter. We will find a way to be with you sometime in the early part of the year. We have friends near Indio in the Coachella valley, and we expect to stay with them some of the three months (from January to April). We spent the summer of 1947 with them, and thereby hangs a strange tale upon which I hope for clarification with you. Amongst other practical (!?) possibilities we are contemplating buying an ex-army-ambulance ~~if~~ in which we could sleep and eat — if only we can find one.

The experiences at Indio are deeply involved with many of the questions on the "relation" of the relative to the Trans-

-relative (all right lets give up the "Absolute") which trouble me.

I would like to visit with you for a short time before going on to Indio — say about the end of the 1st week in January; and then spend as much of the time remaining after the Indio stay with you. The new baby is to come ^{early} in March, probably in Los Angeles, but perhaps I can occasionally visit you from there.

I have suffered much in this life, perhaps to further awareness to discrimination

I cannot yet lay claim,

I believe; from this awareness, that it is neither

intellectual solitude nor practical
need (which is not yet raven - one)
~~which~~ that forms the background
of pain of my life now - and
for many years past. I am
happy in the world - miserable
out of God. It is the sanguine
barrenness of being from which
I suffer - and there is no
relief short of the Goal. Thus
my existence is a living
witness to the insufficiency
of conception and perception
— just as you view it.
Life on the lower peaks is
suffocatingly immersed in
selfness and ulterior motives.
With me, this consciousness
of personal ambitions and vanities

has had a paralyzing effect upon terminations — so that I have more unfinished work — some "just about ~~at~~ finished" — than the dozen published papers would ever evidence. I cannot touch them — even when, as in some of the recently begun work, it bears intimately on the problem of clearing a bridge to the vision of the Supernal Peak — from which all is sustained. Thus there are extensive developments along the lines you suggest, formulated under strange circumstances in the afore-mentioned summer of 1947 — much about the Divine Principle, which requires

an openly infinite formalization^③
(it can never be completely formulated
— but there is no degree to which
it may not be formalized) —
leading to a Divine Logic,
Algebra, Geometry, etc. It is to
be divined everywhere in its
partial "mental" and "material"
manifestations — in the tree-
like structures of Dialectic
Logic and Mendelian Genetics
(which must be generalized to possess
both involuntary as well as
evolutionary symmetry) — In the
opening out of the Dimensions
in the infinite spheres-within-
spheres geometry which must
replace our present point-
bottomed conception of Space
(All change in the relative

world is just a shifting of
consciousness — the non-liberated
being dragged along in a collective
net — through the infinitely
convergent and divergent sequence
of spheres — microcosms within
macrocosms — the "fundamental
particles" are "closed universes"
on the next inner level etc.
etc. There is a perfect Crystalline
pattern in this — a law of

"Cosmic Symmetry" is obeyed) —
- In the structure of the ether, in which all
material particles are cavitations. Etc. Etc.
Well, I cannot work on any

conceptualizations at present,
for I am sick with the
sickness unto death of
living without the direction
of DIRECT BEING.

Yours for Direct Being,

Mel

(M.A. Melvin)

P.S.

(4)

Dear Friend,

This is an ungracious letter after your so-very-wonderful one, but it is best to get it out. I hope to respond to many of your detailed remarks with calmer clarity at another writing.

"The Nature of Scientific Theory" is old stuff dished up when the editor of "Main Currents" needed more material to fill up the issue in a few minutes. We happened to be visiting them on a weekend, and I had my Thermodynamics notes with me.

I recognize the allusion to the stream with its "hidden creatures" - though perhaps I have not recognized all.

I went through psychoanalysis in the first three or four years of this decade. Good perhaps for clearing away underbrush so that the real problem might be revealed. But then in recent years: psychic research, experiments with "communication" and subsequent comparison with the literal interpretation of Christ's words and the "many answers" of the theosophists, have brought in new confusions and conflicts.

Anything you will say on the degree of relative truth of:

1. Literal interpretation of Christ's words.
2. Details of the occultists,

will be helpful.

Love,
Mel

December 7, 1948

Dear Franklin Merrell-Wolff,

After writing down the two questions in the last letter, I was sure that they were inadequate formulations of the essential issue involved. They, and the rest of the letter, were allowed to stand, because they expressed emotional states from which I seek emergence. And, in Sangsara, expression seems to help this process. The real essence of the problem is, I think, stated in the following query.

From the point of view of the thoroughly Awakened state, is there any value in distinguishing degrees of Truth in the unawakened relative world? Or are they all—perceptive-conceptive Science, Philosophy, Occultism; perceptive-affective Music and Art; conceptive-affective Religion—are they all but diverse forms of bondage? Is Science but a close-linked, chromium-clad and nickel-plated chain net, Music a golden-linked net, Art one of silken strands and marble filaments, Occultism a loose linked net of cobwebs and more or less reproducible mirages, and Religion an enclosure of stirring flames and soothing currents—all together constituting the Space-Time Straitjacket?

Or, applying the same query to Mysticism, itself, in the relative world: Why should the one consciousness (you or =anyone of us), when thoroughly Awakened, “choose” to go back into the dream to try to persuade the other illusory-transient characters of the nullity of the dream? When put in Cantor’s transfinite-number notation, with the associated trans-relativization of the Absolute, I can vaguely discern a glimmer of an answer: There is something in the structure of the Divine Principle which requires the level of $\aleph_n$ to consider the level of $\aleph_{n+1}$. *God*, of course, is the Symbol to end all symbols—the Infinity of all transfinites. As I implied in my last letter, this formulation must lead to a non-Eudoxian Divine Geometry, a hierarchically infinite Divine Algebra, and so on. But to one who is not even in $\aleph_1$, and yearns for the shortcut to Infinity, this is too painful to work on. Perhaps, with the comradeship of your elder, calmer spirit, I could.

Mel

Dear Franklin; / About the "Introductory essay", it was a draft. I submitted it with the statement that I would modify it in accord with suggestions. But did not contemplate them removing it entirely, and suggesting I "make it into a book".



TEMPLE UNIVERSITY
COLLEGE OF LIBERAL ARTS
PHILADELPHIA, PENNSYLVANIA 19122

I thought you would also be interested in the other enclosed paper.
Hope to see you at Assembly.
Love, Mael

May 28, 1979

{ I also wrote Ajaya again about this.
[This is a copy of a letter to Swami Rama

Dear Swamiji:

Thank you for the lesson which you and the Institute have taught us concerning invitations and expectations. We can of course meditate and watch our breathing anywhere and each place can be - or is - one more step towards freedom.

I am concerned however that the promise to Dr. Wolff, made by you through me two years ago, be fulfilled, i.e., that he and his family receive a letter stating explicitly the royalty terms under which his book will be published. As one of the great chain of great beings, and as your brother in the lineage of Shankara, he deserves this courtesy. Sincerely, Mael Melvin

C. Dr. Franklin Merrell-Wolff
Swami Ajaya

Mexico:

ADDRESS FROM JUNE 3 - JUNE 15
DR. M. A. MELVIN
c/o DR. J. PLEBAŃSKI
DEPT. OF FISICA
CENTRO DE INVESTIGACION DEL IPN
APARTADO POSTAL 14-740
MEXICO 14, D.F. MEXICO

Home address of the Plebański : Dr. J. Plebański
(Mrs. Plebański speaks only
Polish and Spanish. She
understands a little English)
Apt 105
Paseo de la Reforma 157
Mexico City, Mexico
tel no.: (905) 5466624

Puerto Rico: From June 15 to the 28th we will be in
touch from time to time with the people at the
following address:

Senor Juan Moreno or Senor Velez
S.Y.D. Puerto Rico
48 M. Rivera St.
Cabo Rojo P.R. 00623

tel no: (809) 832-7164

From June 28 - July 2
c/o Hotel Caribe - Hilton
San Juan, Puerto Rico

July 3 we will be in Chattanooga. Will telephone

EXTRATERRESTRIAL INTELLIGENCE: STARMAKER OR YOGIC?*

Mael A. Melvin

IV-B

I would like to take a minute off my time to speak to the previous question. God can take care of himself, of course, and I really do not want to presume to speak for Him. But I might say that the question was based on a misunderstanding of the theory of relativity: even a God subject to the laws of His own nature would be quite alright in the situation posed by the question. To a photon it takes zero time to traverse the whole universe. A photon with a prescribed direction is omnipresent everywhere in the universe. To that photon the instantaneous spatial universe is a mere point (with inner structure!) So that creatures of light are present everywhere at each time, and presumably the Deity is more than a creature--rather the Creator--of light. Thus this is not a serious question from the point of view of the theory of relativity.

Let me however stick to my own last. I want to thank both Dr. Atalay and Dr. Marx for their informative and stimulating very full remarks. My first intention is to fill in some points in Dr. Marx's presentation, from a slightly different point of view. My second and main objective is to point to a question which in my opinion is not given enough consideration by the people who are discussing extraterrestrial intelligence. It has much to do with the most enigmatic and most problematic aspect of the problem.

As a preliminary it is appropriate to define my title so that you know what I am talking about. This is particularly the case since some people have trouble

*To Ben.

with the adjective "yogic". Let me then say what the terms "extraterrestrial intelligence", "starmaker" and "yogic" mean to me.

Now first "extraterrestrial": We could of course get involved with the traditions of mankind which deal with non-material entities or trans-material entities. We do not mean that. We mean a materially embodied consciousness which is not indigeneous to this planet, to the earth. That is what we generally mean nowadays by "extraterrestrial". Now intelligence. There is an old definition by John Dewey that I remember from my student days which went like this- "intelligence is the capacity to delay and modify reactions according to experience." I was just thinking about that definition this morning when formulating notes for this talk [which I was just recently asked to give] and it struck me that it is not really a satisfactory general definition anymore. It is a valuable definition for the technological intelligence, particularly if you mean by "experience," past reactions. But if you think about it-- "the capacity to delay and modify reactions according to experience"--why any properly designed subtle machine can do that. So I do not like that definition too much, and that brings me to another. My definition, which I believe corresponds to a more human intelligence is the capacity to experience internally and react externally to the previously unknown. The experiencing of the previously unknown seems to correspond more closely to what is essentially/^{human}in contrast to mechanical. The profound sensitive response to the new is the yogic type of intelligence; the effective reaction thereto corresponds to the creative technological intelligence. Now let me contrast the two a little bit more. There is the technological intelligence which deals with the exterior world--there is the yogic intelligence, which is responsive rather than reactive--i.e., "witnesses"--the interior world.

The term "starmaker" comes from Olaf Stapledon who is even now a rather unappreciated genius of science fiction or, what may come to the same thing, future fact. In the 1930's Stapledon wrote some classic books, one of them titled "The Starmaker", another "Last and First Men".¹⁾ Though I know little of modern science fiction--or of futurist thinking--to the extent that I do know it, it would seem that many major and leading ideas come through Stapledon--generally without acknowledgment. Among these ideas, Stapledon had the conception of the Starmaker, and infinitely great but yet evolving never-completed creator who creates, creates, and creates--and destroys. Many aspects of this conception are cognate--perhaps unbeknownst to Stapledon--to the ancient Hindu conception of Shiva in and after the Vedic period, in which he grew to greater and greater stature embracing all aspects of the universe. Now, in line with the mainstream yogic tradition, our consciousness can identify with and become that of the Starmaker.

In Stapledon's Starmaker what appears somewhat diminished in relation to the externalizing creative manifestation²⁾ is the component of introception. This is a term which we owe to Dr. Franklin Merrell-Wolff in whose books--more than any others--we find described in precise Western terms the noetic quality of the yogic consciousness.³⁾ The term introception is constructed from the Latin intro: "within", "into", "in" and capere: "take". We may suggest as a capsulized definition of the "introceptive" or "yogic" consciousness that it is a "cosmic introspection". In contrast to ordinary introspection, as considered in psychology, here the individual consciousness becomes cosmic while looking inward.⁴⁾ The introceptive consciousness is responsive in the sense of "witnessing" but with a non-reactive detachment. This detachment from small self-interest orients the consciousness towards what is ultimately complete altruism--the

is
non-ulterior Love often spoken of in religions. Introception/ also affirmed
to have other--noetic--value in providing us with a supremely vivid awareness
of the intrinsic nature of all that is. Thus the introceptive or yogic con-
sciousness complements as well as contrasts with the creative technological
consciousness. A developed form of ^{either} / may of course be called "intelligence".

Now let me state my main thesis: It is that unless there is a balance
between the two types of intelligence there will not be any long-time viable
society. The immediate danger will be from catastrophes induced by unbalanced
technological intelligence. It is hard enough anyway to have a society last
very long because of cosmic catastrophes which, while improbable, are likely
over long periods of time, and might be coped with only by an intelligently
balanced society. We must have a balance between the yogic and the technological
intelligence to maximize the chance for survival whether from internal or exter-
nal shocks. And I would expect the same to be true, in the long run, for other
planets.

Now I would like to review the seven parameter formula for the probability
of our finding extraterrestrial communicative societies, and conclude by relating
the last and most enigmatic parameter with my main thesis. The formula reads

$$N_c = N_* q_w q_p \eta_p q_l q_i q_t (L)$$

I have used essentially the same notations that were used by Dr. Marx but
will make slight variations in the numerical estimates, based on recent astronomical
considerations. It is interesting that one can get essentially the same results
in several different ways. It is a kind of steady/^{state} analysis, historically go-
ing back to Struve, Shapley, and Dole; recently, Drake and Sagan and other
people have written about it. What does/^{this} famous seven-parameter (or eight-para-
meter) formula mean? We are trying to calculate the number of civilization N_c

with which we might be able to communicate at any given time. The idea is that we make probability estimates. First N_* , the number of stars in the galaxy. The best estimate right now is about 4 hundred thousand million. And up to a factor of three one way or the other, it is apparently about right. Now we have reason to throw out of consideration stars for which environments in their vicinity are unsuitable for life. We should throw out about half the stars because ^{not} they are first-born stars. They are/made of recycled matter like our sun; they only have hydrogen and helium. They have gone through the process of birth only once. Because they are not the product of recycled matter they are unsuitable; ~~simply because~~ for life, as we know it, we need the kind of matter that comes with the higher elements. We need carbon, oxygen, nitrogen. We even seem to need chromium/^{and} other heavy elements. So the first born stars are out. That makes a factor $q_* = 1/2$ ^{for stars} around which organic --molecular life could flourish.

Then there is another factor $\frac{1}{2} \times \frac{1}{10} = \frac{1}{20}$ for q_p , the probability of a suit-
with
able planetary system, or the fractional number of stars/suitable planetary systems. The argument for the $\frac{1}{2}$ is that only about half of the ~~stellar~~ systems are suitable because only half of them are "bachelors," or singletons, like the sun, and the other half are binaries, ternaries, etc. Around a multiple star system the orbits are so irregular that it would be hard for life to adjust and survive. Life needs to be somewhat comfortable. Now for the $1/10$ factor. Most people believe that you cannot have a star too hot, too big in mass or too faint, too small. On the one hand the central star cannot be too big or too hot because then it would evolve too fast. The most massive stars known evolve, go through their prime and start dying, in half a million years. That is too short for the evolution of life. On the other hand, the very small stars--very faint

stars of whom there are many--are presumably unsuited for life, because any planet around them which would get enough warmth from the star would have to be so near to the central star that its rotation period would be locked in to its revolution/like the Moon or like Mercury. Essentially, it would keep the same face for long periods on the hot side, and all the atmosphere would freeze out on the other side. Thus we have to take into consideration only the stars in the middle of the range, and they are called "F,G,K" types. [As is well known the astronomer's acronym for this spectral sequence is: "Oh, Be A Fine Girl Kiss Me,"] In the middle are the warm stars, the intermediate stars. The sun is such a "G" type star, actually a G2 or G3 star. (It sounds like a Civil Service classification.) Limiting the stars to those from "F" through "K", types reduces the number to 1/10. An additional, purely astronomical, reason for limiting consideration to those stars belonging to spectral types below the middle, i.e. F and below, is that beginning in this range they rotate much more slowly, which is a probable indication that they have formed a planetary system to which the central body has transmitted most of its angular momentum. The hotter stars above the F type all rotate fast.

To conclude that q_p is indeed 1/20 (rather than $1/(4 \times 10^{11})$), besides such inferential arguments, we could hope to see direct evidence in the nearby stars of the wobble due to their planets--such was the goal of Van de Kamp's Barnard star studies and others. Unfortunately the situation is not settled. On the one hand several observers restudied the evidence and found Van de Kamp's data not quite reliable. He rechecked his own data very carefully, and found many have been that the reason he had been getting a wobble / due partly to the fact that he had changed his telescope lens at a certain time. On the other hand, the same observers who had impugned Van de Kamp's data: Eichhorn, and Gatewood, found

that there was some evidence of planetary wobbles in the nearby stars. Since then some other observers have verified the same results on Van de Kamp's stars. They were different from Van de Kamp's. Thus there are a few stars where there is some evidence; but it is inconclusive. It is very important to get direct evidence; if we had at least found one other star near us with an observed planetary system, we would have been very happy with the estimate of $\eta_p = 1/20$.

Now the same thing is true about the origin of life elsewhere. On Mars, the evidence is ^{con}clusive. ~~It is not negative.~~ Some people, do not believe that the evidence against life on Mars is conclusive. There were some very strange reactions in the chemical experiments. The effects were not like those in earth chemistry nor like earth biology. But still we do not really know that there is any life, however low in form, on Mars or anywhere else in the universe. But to counter that, on the positive side, one of the most important discoveries in recent years, is that there are many interstellar organic molecules. Dust in the universe plays an enormous role and organic molecules form on dust. ^{Investigators have} found oodles of organic molecules, not of course living organic molecules, but organic molecules. For example, there is a gas cloud in Sagittarius which has an enormous amount of alcohol in it. It has been estimated that it would make 10^{28} bottles of whiskey, which is more whiskey than the entire human race has consumed throughout its entire history. That is just one gas cloud in Sagittarius. Well, many bottles of whisky do not make life (on the contrary!) but still it is a reassuring prospect that organic matter is formed out in space. So that is alright. An optimistic view is that η_e is of the order of unity; a conservative view would set $\eta_e \sim 10^{-2}$. Now similarly about the rise of intelligence; we have no direct evidence other than from ourselves of course. But there is the prospect of intelligent life developing in a number of places and then the prospect of a technologically

developed intelligent system which wants to communicate. That is extremely important because, except for ours, the number of such systems could be zero.

In other words the total number out of the entire galaxy could be one, which the probability would make $q_1 q_t = 10^{-11}$ rather than a substantial fraction comparable to 1.

Now finally, the most enigmatic of all factors that we have to take into account. It is that what is very important is the life-time of the civilization as compared to the life time of the galaxy. The life time of the galaxy can be taken to be 10^{10} years. According to ^{estimates} that have been made the ratio is either 10^{-4} (10^6 years) or 10^{-8} (10^2 years). If you take an ^{the ratio of} optimistic view that life-times is 10^{-4} , then the life time of a technological civilization is one million years, and if you take the pessimistic view the lifetime of a high-technology-civilization is only one hundred years. Assuming the most optimistic values ^{that} there are of the order of 10^{10} ^{potential} civilization-bearing planets in the Galaxy you get that there are a million such civilizations in the Galaxy right now. If you take the ~~other extreme~~ conservative values $q_1 q_t \sim 10^{-2}$ $L \sim 10^2$ years, you get that there is just one, ours. Clearly there is one rather low-grade, technological society.

This brings me to a classification of technological civilizations by the Russian astronomer Kardashev. [See also the aforementioned books of Stapledon]. He recognized three types of technological civilizations. Type I would be like ours. It would utilize the present resources of our planet, the total amount of energy available on the planet ultimately being used. In type I civilizations, they would be using and exploiting energies comparable to ours, which in energy output corresponds to about one light bulb per star in our galaxy--about 10^{11} , a hundred thousand million light bulbs going all the time. That is our present output of energy.

Next, the type II civilization would use the entire energy of a star, like our sun. It is easy to imagine how that could be done.

As Dyson and others have suggested, one could surround the central star with a shell, a shell which ^{would be} ~~made up~~ made up from the minerals of the planets, and ^{which would absorb and reemit} ~~trap~~ the radiant energy on its outward journey with the ^{in the meanwhile} ~~utilizing~~ a goodly fraction. And of course what would come out from the

whole system would be a lot of very low-frequency radiation, heat radiation.

So that such an object would be detected by the fact that it is a strong infra-red radiator. Of course one could approximate the trapping shell

by having a lot of space colonies filling the space around the central star.

I won't discuss how realistic this possibility is beyond remarking that a

simple calculation shows that the thickness of a shell made up all the

planetary material in the solar system, and of radius equal to the distance

of the earth from the sun, would be about one meter. We may ourselves reach

the level of type II civilizations after about two thousand years according

to some estimates. Perhaps they exist. There is no substantial evidence the existence of

though Lowell for example has reported a number of strong infrared sources. Of course

they have ^{had} other interpretations ^{given to them}. But we do not really know. There is a missing

mass problem that Lloyd Motz can tell you about, in that there seems to be

mass in the universe which is invisible. And so it may very well be that there

are many civilizations of type II. It may even be that there are

intelligent, living beings on systems around little "dark" non stars

either away from or near ordinary stars. Some of these could be bigger than

Jupiter but not big enough to have made it to the thermo-nuclear phase.

Shapley pointed to the possibility of such objects in between stars nearly

two dozen years ago. Life on planets around such objects is not ruled out

because there is an inner warmth from such a large object. Radioactivity and gravitational contraction, as in the case of Jupiter, leads to warmth, and such a system could conceivably tolerate life. The universe may be full of unfamiliar possibilities.

Type III of Kardashev is a civilization that would use the entire energy of a galaxy. There is no doubt, that if there are such, they would be much more easily detected. Imagine a pulsed signal with the energy output of a galaxy coming towards us! Now we cannot conceive of how we could build a shell around a galaxy, but if the denizens of Type III spread throughout the galaxy, if they proliferate it like a cosmological vermin and are integrated in a galactic union, they might approximate a trapping shell for the whole galaxy.

Now let me come back to my main point, my main thesis, which is that there is a certain complementarity between the two ^{types of} intelligences in determining the lifetime L. If you have an intelligence that is entirely biased on the side of technology---just a technological monster---it's life time is probably very short. Very, very short. A hundred years might be optimistic because of a nuclear/holocaust resulting from external or internal stresses. In contrast you might have a civilization, that would be primarily contemplative, devoted to the expansion of consciousness. And shortly I would like to read you a few quotations which indicate what that means. If the society is entirely contemplative then it will not be viable either---at least on the material level. With a little primitive technology it might last a long time but it certainly will not be an interstellar communicating society on the material level. We propose that the optimal society with the maximal lifetime would come with a balance between the two intelligences. This is formalized by having L be an

increasing function of the product

$$q_y q_t = q_y (q_1 - q_y)$$

where we have made the natural assumption that the sum of the probabilities for the two intelligences q_y (yogic) and q_t (technological) is the ^{fixed} probability ^{the rise of} for/total intelligence q_1 . A simple application of calculus shows that L is extremalized for

$$q_y = q_t = q_1/2$$

^{use/2 to the level of q_i} The requirement that L shall be a maximum is then satisfied if it is an increasing function of $q_y q_t$. If we make the special assumption that this function is a simple positive power, $\alpha (q_y q_t)^p$, then we can write the probability for Galactic communicating civilizations at maximum

$$\bar{N}_c = \alpha N_* q_* q_p \eta_p q_l \frac{q_i^{2+p}}{2^{2p+1}}$$

and we see that $\bar{N}_c$ goes up as some power greater than 2 of the probability for intelligence to develop when life is present.

I want to conclude with some quotations of the traditional yogic view which exhibit how close it is to the aims of this and its sister conferences.

The ancient scriptures, the most ancient scriptures on record according to many people, are the Vedas of India; ^{they} ~~which~~ are 65 hundred years old according to the estimate⁵⁾ of Tilak--"the Maker of Modern India" (Gandhi). There are ^{I am} four Vedic books and ^{a few} / going to read you / short quotations from three of them⁶⁾. The first quotation is from the Rig Veda. Since God's name is invoked here, it might be of some value to read first what the editor says: "The Rig Veda was of the opinion that God himself is ~~pro~~ ^{creating} this universe. Hence how can one afford to make distinctions and differences."

And here's a direct quotation from the Rig Veda: "He, the One wishing to be the Many, inhibited His primary self, plunged in meditation and evolved into the world of matter and mind into both of which he entered." And then still further it says, "He the One desired that He should create Himself into Many." And then there is a remark by the editor saying -"the Rig Veda did not worship any dogmatism, it worshiped Jnana or knowledge." The Rig Veda speaks of the universe as "an integral multiplicity". And the god of the Rig Veda is not a mere abstract entity called by a certain name. "He is a god of social service. Thus He, 'Clothes the naked, cures the sick, makes the blind see, and the crippled walk about.'" I think we can all recognize something that was written 4500 years later.

Then from the Atharva Veda, there is a quotation which refers to the goal of this Conference where it says: "May all the beings see me as a friend, and may I see all the beings as a friend."

As I edited these last lines I received word of the passing of a friend. He fell in the recent "worst civil aviation disaster in the history of the U.S." To him I have dedicated this paper. What can one say in the face of the greatest/^{mystery} that confronts each one of us? Ben embodied in his own nature the fine balance between the technological and the Yogic of which I have written. A genius in the biomedical invention field coupled with a highly developed meditative nature, he was the author of an original and engaging⁷⁾ book and a reporter, in his many lectures, of extraordinary experiences and visions. We shall miss with all our heart his smiling kindness and unique humor. Ben, ~~you are~~^{is} no longer "only a tourist" in the spiritual realms. ~~He is~~^{He is} now a native.

- 1) William Olaf Stapledon, Last and First Men and Starmaker (issued together) (New York, Dover Publications 1968).
- 2) The Shaivite Hindu philosopher would say that this corresponds to the Shakti aspect of Shiva (or the first of his five "faces"). It should be remarked that in his later writings Stapledon emphasized more and more the central significance of what we here call "yogic intelligence" or introception.
- 3) Franklin Merrell-Wolff: Pathways Through to Space. A personal record of Transformation in Consciousness (Richard R. Smith, Publisher; New York 1944; reprinting by Julian Press--now Crown-New York 1973; paperback reprinting by Warner).
The Philosophy of Consciousness Without an Object, Reflections on the Nature of Transcendental Consciousness. (Julian Press--now Crown-New York 1973).
- 4) Dr. Wolff has many discussions of the introceptive faculty in his books. One of the earliest technical definitions is found on p. 228 of Pathways Through to Space.
- 5) Bal Gangadhar Tilak, Orion (Bombay, Sagoon 1893). The Arctic Home in the Vedas (Poona, Managar 1903).
- 6) The quotations are taken from the book The Universalistic Thought of India (From the Rigveda to Radhakrishnan) by Ram Narayan Vyas (Lalvani Publishing House, Bombay 1970).
- 7) Itzhak Bentov, Stalking the Wild Pendulum. On the Mechanics of Consciousness (Dutton, New York, 1977).