An interview with Dr. Randell L. Mills of BlackLight Power, Inc.....
by Art Rosenblum, *Aquarian Research Foundation*

Randell Mills—New Energy and the Cosmic Hydrino Sea

Editor's Note: We are delighted to have this candid interview with Dr. Randell Mills of BlackLight Power, Inc., who since 1991 has certainly been one of the most important scientists and business persons in the New Energy field. The interview was independently obtained by Art Rosenblum of Aquarian Research Foundation, *before* we were even aware that it had taken place! We thank Art for allowing us to reprint Dr. Mills' interview in full. Though Dr. Mills prefers not to be associated with "cold fusion," as he makes very clear in the interview, the hydrino facilitation of low-energy nuclear reactions are explicitly mentioned in his Australian patent (see this issue pages 67-72). Dr. Mills believes these reactions do not explain the spectacular energy releases. —*EFM*

Conversation between Dr. Randell Mills (RM) and Art Rosenblum (AR) at BlackLight Power

AR: Dr. Mills, this is Art Rosenblum, in Philadelphia. I'm with the *Aquarian Research Foundation*, we've been doing research on the future of the planet since 1970, a small, tax exempt nonprofit, and I'm extraordinarily interested in your breakthroughs in energy.

RM: OK. In very layman's terms, we're catalyzing hydrogen to go to a lower energy state, it's stable, and it explains an enormous number of things that physicists haven't been able to describe or reconcile and it came about from when I was working at MIT. I got a paper on free electron lasers from [Professor] Herman Haus [Ed. Note: of the Dept. of Electrical Engineering and Computer Science], and he was applying non-radiation, radiation that analyzed basically the mathematics of why the free electron laser worked. And I said, "Well, the atom has an electron that's bound and it's not radiating and why don't I apply that math to the equation of the atom?" And I did, and it permitted me to solve everything from the masses of fundamental particles to the rate the universe is expanding—quarks to cosmos—and predicted there were these other lower energy states of hydrogen— and we've amassed massive amounts of data.

We have two term sheets from utilities [utility companies] now. We have people very eager to commercialize this and we've been able to make independent validated energy cells that produce a thousand times the energy of burning hydrogen.

AR: A thousand? I heard a hundred.

RM: Well, that was Penn [Pennsylvania] State University's test, but they didn't do lifetime tests, they stopped that after about 700, 800 hours—something like that, or, excuse me, minutes. They never did lifetime tests. They ran it for a finite period of time. We have done lifetime tests here with Atlantic Electric and gotten a thousand times the energy of burning hydrogen.

Dr. Randell Mills (R) and Art Rosenblum of Aquarian Research at BlackLight Power, Inc. in Malvern, Pennsylvania

AR: I see. Now what happens with the hydrinos? They, from what I read, go off into space but would they also combine with oxygen and form water?

RM: No, they can't burn. I had a utility executive ask me this and he said: "How can I go back and explain this to my Board of Directors? Once you make this low-energy hydrogen, can it come back up to its normal energy level?" Because it's at a very, very low energy level, it's released quite a lot of energy, and it turns out it can.

Now the way to describe that, in layman's terms, is if you take hydrogen and oxygen and burn it and you get water. What is the likelihood that water will spontaneously absorb energy and revert back into hydrogen and oxygen. So, first of all, you cannot get low energy hydrogen to revert back into normal energy hydrogen unless you hit it with a cosmic ray or some very energetic particle and completely knock the electron away from the newly-formed low-energy hydrogen.

Secondly, the electron is at such a very, very low level, it's impossible for it to react with anything other than another low energy hydrogen atom.

AR: So, I see, the electron can only react then with another low energy hydrogen....

RM: Another molecule, and the molecules are very very stable. In fact, I have some beautiful data from the infra-red spectrum of the Sun taken from a number of very, very prestigious telescopes from around the world, including the National Solar Observatory, that match the rotational spectra of this new form of hydrogen, with lines that they have not been able to identify to significant figures. I mean, they match at six places.

AR: Wow!

RM: Yeah. There's about, I don't know, maybe sixty lines, something like that, that match up. And they haven't been able to figure out what it is. And, all in all, there's about a hundred—there's probably about two hundred spectral lines from interstellar media, from the solar corona, and a number of astrophysical studies haven't been able to be explained.

Now let me tell you the significance of that. It turns out there's a long-standing mystery about the Sun. Scientists don't know why the gases around the Sun are two million degrees and the surface is only six thousand. Usually heat flows from a hot body to a cold body, if the energy is being produced in the core of the Sun how is the gas around the Sun hotter?

Well, it turns out that the Sun has a very, very large number of spectral lines that can't be identified and they correspond to the energy transitions of this new low energy hydrogen. And the power from the intensity of those lines matches the amount of power that can't be explained by nuclear reactions occurring in the Sun. I'm referring to the solar neutrino paradox, which proves that the Sun is not making all of its energy by nuclear reactions—about half of it is unaccounted for.

The other thing that is a very big problem in astrophysics is that if you look at the Milky Way galaxy, it's rotating a lot faster than it could possibly rotate and be stable. It should fly apart, because there's not enough gravity to hold it together—and that's why they propose that there is this dark matter, this material that does not emit visible light, or light of known spectral characterization. That is, every element has its own particular spectrum and they have found that, if they look at the known elements from the spectrum of our Milky Way galaxy, there's not enough mass there with known elements to hold it together. There has to be some other, unknown element holding the galaxy together and they call it dark matter. I don't know whether you have heard that.

AR: I've heard it, yes.

RM: And it could represent up to 95% of the mass of the universe. It turns out that scientists have looked in the extreme UV region of the spectrum that's much higher energy than visible light, and every one of the spectral lines for these low energy transitions of hydrogen appear in that spectrum. In fact, this low energy hydrogen is this missing mass, this dark matter.

AR: Aha!

RM: And that shouldn't be a surprise, because most of the visible matter, about 95% of the visible matter is, in fact, hydrogen.

AR: That's hydrogen at normal energy?

RM: At normal energy, right.

AR: I see, so what causes hydrogen at normal energy to become low energy hydrogen?

RM: Well, it turns out that there is another mystery of the Sun. If you look at the spectrum of the Sun, you see when electrons of atoms undergo transitions, there are very, very sharp spectral frequencies. In other words, energy is characterized by a very, very specific frequency. Do you follow me?

AR: Yes.

RM: Like a radio station. It isn't very broad, it's one particular frequency. The pattern of those identify the different elements.

AR: Right.

RM: Well, it turns out if you look at the Sun itself, at the photosphere— that's the big glowing ball—if you look at that through a spectrum, you'll see starting at about 912 Ångstroms, going all the way to about 350 Ångstroms, is one big massive broad band that is not a line spectrum. They call it the "912 wedge" and that is called a continuum peak. In addition, there is another big wedge superimposed on that which starts at about 734 Ångstroms. In other words, it's hundreds of Ångstroms broad and it should only be tenths of Ångstroms. You follow me?

AR: Right.

RM: It turns out if you have three hydrogen atoms collide simultaneously, two of those hydrogen atoms interacting with a third can make the....excuse me ... two of the hydrogen atoms, say the second and third acting with the first, can catalyze it to go to its fractional state, one-half.


Dr. Mills before tesifying at Fusion Energy hearings in the US Congress on May 5, 1993. ***(Photo: EFM)***

We have people very eager to commercialize this and we've been able to make independent validated energy cells that produce a thousand times the energy of burning hydrogen.

AR: What do you mean "fractional state, one half"?

RM: Well, if you take the Rydberg formula, you know the principal energy level formula of hydrogen, 13.6....let me write this down, this will tell you exactly what we're doing. Very simple— take the formula 13.6 eV divided by n-squared. In the theory—alright, let's go back even further—in 1886, Rydberg recognized that if you look at the spectrum of the Sun and you look at all the infinite number of lines coming from the Sun, if you are going to put integers in that formula, take the difference between those energy levels, it would assign every line coming from the Sun, with the spectrometers of the day. Because the lowest energy transition in that formula was n is 2, until they developed the UV spectrometer then the lowest energy then was n is 1 and that's called the Lyman series. And then, in 1886 Rydberg put the whole thing together—Balmer, Paschen, Lyman —that is the different transitions, transition theories in the Sun going from 2 to 1, 3 to 1, 4 to 1, 5 to 1, that would be the Lyman; going from 3 to 2, 4 to 2, 5 to 2, 6 to 2, that's the Balmer series.

OK, Paschen's 4 to 3, to -3, 6 to 3 etc, in other words, 3 is the final state that's the Paschen series. So, there are all these series of lines and Rydberg completely summarized all of them by saying "Well 13.6 over n squared [n^2], where n is an integer 1,2,3,4,5,6,7,8 to infinity. Now, that would correspond to the ionized electron.

Well, what I'm saying is n can not only be an integer, n is 1 is the first non-radiative state but n is one-half [n=1/2] is non-radiative and stable, n is one-third [n= 1/3] is non-radiative and stable, n is one-fourth is non-radiative and stable.

AR: Non-radiative and stable, you're saying?

RM: Stable, yes. And to go from these non-radiative states—from one non-radiative state to another non-radiative state—you need a catalyst. You need a resonant energy transfer that takes away part of the energy in a resonant transfer, and makes the atom unstable, and then the rest can be emitted as light. And that's what you're seeing from the Sun and from the interstellar medium. And no-one knows why flares occur. The Extreme UV Explorer looked at a flare on a DM planet called A-Microscopae, about this time two years ago and, it was published in *Science* last year by Boyer at the Extreme UV Center at Cal-Berkeley, and every single line in order of energy, fit that formula 13.6 over n- squared where n was 1 over I, I being an integer. In other words a half, a third, a fourth, a fifth, a sixth—in that principal energy formula. Do you follow me?

AR: Yes.

RM: All of them were noted in *Science*, the magazine *Science*, as being unidentifiable. Do you follow me?

AR: Yes

RM: So, it turns out that the electric field between the proton and the electron has a lot of energy stored in it. Right, if you talk to the Tokamak guys up at Princeton, which are now closed down, because they wasted total world-wide about $40 billion of taxpayers' money. But there's a much more elegant way of making energy from hydrogen. They didn't have to push the protons together to get fusion, there was a tremendous amount of energy between the neutron and the proton. They just have to find a way of releasing it.

Like they are putting in the equivalent amount of energy of a million electron volts because there is, in fact, a million electron volts of potential energy in the proton's field, so two like charges repel each other with that amount of energy. If you had the opposite charges you should get that much energy back out, right? But you can only get out 13.6 [eV] because that is the first stable non-radiative state, and you have to have a mechanism to release more energy from hydrogen.

Of course, it's known that hydrogen atoms react to form molecules and release even a little more of that energy, right? But they did not do it radiatively. Over the entire universe you'll never see the bond energy of molecular hydrogen formation. You have to have a third body to take away the energy.

Do you follow me? That's what we're doing, we're taking away the energy with a resonant...like an energy sink, that matches the amount of energy that hydrogen will give off to undergo transition to these other non-radiative states.

AR: OK, now if the hydrogen....

RM: How does it happen in space? Well, once you make one-half it becomes auto-catalytic. It turns out that the potential energy of the hydrogen atom is 27.2 [eV], the amount of energy you have to remove in order to undergo these transitions between, let's say from the n is 1 state, the n is one-half state is 27.2 [eV]. That's the amount of energy you have to remove and then once you form fractional hydrogen it has a binding energy of a multiple of 27.2 [eV] and becomes auto-catalytic.

So, what you are seeing in space is, in fact, low energy hydrogen, auto-catalyzing to lower and lower energy states.

AR: I see.

RM: That's all explained on the web page, I mean the balance reactions etc.

AR: OK, but I'd have to be a physicist to fully understand it. My brother is one.

RM: Well, let him take a look at it, he can translate it for you.

AR: OK. Tell me one simple thing. Say the world was producing a tremendous amount of power this way, all over the world, there would be this huge number of hydrinos going off. What would be the effect of that?

RM: Actually, it's very, very little because there's very, very little mass balance. Because, in other words, low mass flow——because you get a tremendous amount of energy. I mean we have independently validated now of a thousand times the energy of burning hydrogen. So you'd use very, very little material.

Dr. Mills (C) at Fusion Energy hearings. Robert Shaubach of Thermacore (L) *(Photo: EFM)*

You would use water, it would be consumed, the water would be going to releasing oxygen, which would be good for the environment, and it would be releasing lower energy hydrogen. In fact, there is enough water just released in the atmosphere, in the biosphere, from the burning of fossil fuels—that will last for hundreds of thousands of years, just removing that water.

..the Tokamak guys up at Princeton... are now closed down, because they wasted total world-wide about $40 billion of taxpayers' money. But there's a much more elegant way of making energy from hydrogen.

AR: But water is plentiful, we know.

RM: Not only that, I mean if you look at a car application. A 200 hundred horsepower car going 60 mph using this process will go a hundred-thousand miles on a tank of water.

AR: Aha.

RM: With no pollution because what you form is a lower energy chemical form of molecular hydrogen that does not react. In fact, you can look at the spectrum of the Sun and you can see the spectrum of lower energy molecular hydrogen, and it's stable at 2 million degrees. It won't even react or fall apart at 2 million degrees!

AR: I see.

RM: It's lighter than air, so it goes out into space. And if you are worried about something in the gas, it's non reactive. You can breath helium, you can breathe argon, you can breathe neon. Every time you breathe, 80% of the air you are breathing is nitrogen that doesn't react with anything in your body.

AR: Exactly.

RM: This is much more stable than nitrogen. Much, much more stable. In fact, you couldn't even *keep* it in your body. You couldn't even keep it in the atmosphere—it would just diffuse out into space because it's very, very light and it travels through containers very easily.

AR: Could it be kept in balloons.

RM: Well it would be very difficult. You could probably keep it in a mylar balloon for some period of time, but it would be difficult.

AR: I see. So, much more difficult than ordinary hydrogen?

RM: Oh *much* more difficult to store than normal hydrogen.

AR: You don't think it would have an effect on the ionosphere?

RM: If anything it would absorb cosmic rays, which would be a good thing, and it would revert back to normal hydrogen, which, again, is lighter than air and will end up in space anyhow. So if anything it would be a preventative. You know, it would be like replenishing the ozone layer it would have some screening effect. But there would be so little of it would be negligible. It really would have no impact on anything.

AR: Well it sounds *extremely* interesting. Do you have fuel cells at your laboratory presently producing, or capable of producing energy from, say, hydrogen or water?

RM: We have cells running here that produced a thousand times the energy of burning hydrogen running now. We are doing some tests with Atlantic Electric, and we're not unreasonable about showing that. There's independent validation reports put out on the web if you need some validation. For example, the Penn State University report. Jonathan Phillips is one of the authors—he's a member of the International Calorimetry Society and the other author, Stuart Kurtz, is Vice-Chair of the Material Research Institute and a double Chair Professor at Penn State University in the Chemical Engineering Department. He runs the Material Research Institute.

So, and there's a summary of reports from MIT Lincoln Lab., Idaho National Engineering Labs, Atomic Energy Canada Limited, Leheigh University, Brookhaven National Labs, NASA Lewis Research Center [see *IE* issue #7—EFM]— a whole bunch of labs are on the net, if you needed other validation.

AR: Why do you think that this information is not published in daily papers and *The New York Times*?

RM: Oh, it will be. We've kept it all pretty secret while we worked it out. Because it's a very, very difficult process. Because what I proposed... You know, I tell laymen this, they say well hydrogen was experimentally known to have this 13.6-over-n -squared [$13.6/n^2$] formula back in 1886 and they tried to build theories around it and none of the theories really worked, because they tried to make the universe mathematical rather than physical. They conflict with the large scale physics. There's a big problem in physics now, you know— they're up to eleven dimensions now trying to unify gravity and atomic theory, and it's just an absolute *nightmare*. Then after all these decades and millions of man hours, it is not coming about at anything convenient in terms of a solution.

AR: What, in terms of a solution?

RM: And I have something that unifies Maxwell's equations, General Relativity, Special Relativity, and predicts everything from quarks-to-cosmos. It works over 45 orders of magnitude. Now the problem is, I have massive amounts of experiments that I can explain in terms of astrophysics, cosmology—like the entire thing—and I have very very pre-eminent people. I've had probably 200 top physicists from Caltech to Westinghouse, you know, from national labs, multi-national corporations, to top universities have looked at this and no one can find a mistake with it, or a single experiment that proves it's wrong. It's very easy to find an experiment that proves quantum mechanics wrong. The Aspect experiment proves it wrong; electron scattering experiments prove it wrong. It's not reconcilable with gravity. There are plenty of things that prove it wrong. Even if you look at the fundamentals, it's not even a *wave* equation. There is an internal contradiction inside the equation itself because they do a substitution with the deBroglie wavelength and it turns out that it doesn't even satisfy a wave equation. That's why the time-dependent has a first derivative with respect to time, not the second because it's not even really a wave equation. Nonetheless, I'm not going to beat up on it too bad. It predicts negative energy states; they've got to use virtual particles and all these compactified

Dr. Mills (L) at Fusion Energy hearings in the US Congress on May 5, 1993. Cold fusion scientist Dr. Edmund Storms (C). Dr. Bogdan Maglich (R) *(Photo: EFM)*

A 200 hundred horsepower car going 60 mph using this process will go a hundred-thousand miles on a tank of water.

dimensions, all this just weird, crazy stuff. But all this comes out of first principle physics and in closed-form equations from my theory.

Think of how it is, if I came up with a new theory and I came up with, say, an eleven dimensional theory or a thirteen dimensional theory that would be OK, that would be perfectly acceptable. But it turns out that my theory says that there are other lower energy states of hydrogen which violates, or is in contradiction to the solutions of one-electron wave equation solution to the hydrogen atom, which is based on probability. And so the universe is not probabilistic at the atomic level, but a fundamental particle is a fundamental particle. It is not a probability density function.

It didn't even make sense to apply probability to a single particle, you know what I'm saying? It's like trying to do statistics on one person! Mathematically it doesn't even make sense, but they used it because they could do these averaging techniques and they could do all these perturbations and get the experimental answers, so mathematically it's very convenient. It's like trying to fit the stock market after you know the answer, you know what I'm saying?

AR: Right.

RM: You apply all these curve-fitting techniques and that's what quantum mechanics really is, it's a bunch of curve-fitting. You add different dimensions, you add virtual particles, and you keep adding negative energy states until you get the right answer. Well here I'm saying that everything's deterministic all the way down to the atomic level. That's going to make these guys look like fools. They're off on the wrong tangent talking about probability. Einstein, de Broglie, Dirac, Schrodinger himself, they all said, "You guys are wrong, you shouldn't talk about a particle being a probability. A particle is a particle." And that's the problem, that's the rub. That's why it took a lot of confidence building and testing. And the other thing was this damned cold fusion! If I did anything I'd rip that out of the history books, because those guys are saying, "Hey, there's some heat source, and we've got some nuclear reaction and, of course, all nuclear products magically disappear, you know it's the same sort of thing as the quantum guys—they're pulling tricks out of their sleeves and they are just trying to hand-wave explanations without anything substantial. You know what I'm saying?

AR: But doesn't cold fusion produce tritium, which is radioactive?

RM: No, it doesn't. I mean, even if it does, let's put it this way. Even if it does, even if you take the numbers that they say it produces as tritium, right? If you take, right you got to obey $E=mc^2$ right? So you have got to take deuterium and then you make tritium and $E=mc^2$, and if you look at how much energy they are getting compared to the amount of tritium they get, it's off by 14 orders of magnitude! I mean that's a big mistake! That's not like 20%, that's 1 followed by 14 zeros.

AR: Right.

RM: That's big. So these physicists say, "Hey, the nuclear reactions aren't accounting for the heat, even if there is trace tritium there, that's not what's making the heat." You see what I'm saying, because they're off by 14 orders of magnitude.

AR: Right.

RM: So they keep saying, "Ah, well somehow the tritium magically disappears, or you know, whatever—and that doesn't cut it in science, you know, you've got to have experimental data. If you look on the walls I have gas chromatography results, mass spectroscopy results, x-ray photo electron spectroscopy results, infra-red spectroscopy, UV spectroscopy. I have proved that we're making this product from our heat cells, you follow me? That's what people want.

So, over the years I've been building up all this credibility and getting all these validating research reports and now I have two term sheets from utilities, Pacific Corp., which is like the third largest generator, put a million bucks in. We've got other utilities that we're working out deals with for millions of dollars. We're just doing a stock offering, that was a $5-million offering sold out in a week. We are probably going to close it out at $10 million.

AR: Is stock available at present?

RM: Ah, there is but we are only selling it to accredited investors, that's people with like a million net worth.

AR: So your brother couldn't buy stock in the Corporation?

RM: Well, we're trying to just sell to accredited investors. You know people that make like $300,000-plus a year, have more than a million [dollars] net worth—that type of thing. But there's a lot of big corporations, you know, that are.....

AR: Going for it?

RM: Yes, it's very, very interesting to see the turn of events, because in terms of the development time line. I mean, what we originally used is, you have to have the catalyst and you have to have hydrogen in contact with other... The most convenient way of generating hydrogen was with electrolysis. The first cell that I made back in 1991 was with electrolytic...with the transition catalyst dissolved in the water and served as the electrolyte and reacted with the hydrogen. And I got excess energy and I validated at MIT Lincoln Labs and Idaho National Engineering Lab and a number of labs that got very [good] multiples of power out relative to the total input power. But I got linked to cold fusion. People were saying "Well you know, this is 'cold fusion'." What we are doing now is a gaseous reaction at about 100 millitors, which is about one-one-thousandth the pressure of the atmosphere. And up to 2,000 degrees, so you are looking at a very, very low pressure reaction with just hydrogen and trace amounts of vaporized catalyst gaseous reaction. We're getting a thousand times the energy of burning hydrogen.

.... Pacific Corp., which is like the third largest generator, put a million bucks in. We've got other utilities that we're working out deals with for millions of dollars. We're just doing a stock offering, that was a $5-million offering sold out in a week. We are probably going to close it out at $10 million.

And the companies, and Westinghouse nowadays for example, what people said is "OK, we believe your theory, we know this is working, we know you are making lower energy hydrogen, but we don't think it will be commercially competitive."

Dr. Mills (L) at Fusion Energy hearings in the US Congress on May 5, 1993. Cold fusion scientist Dr. Edmund Storms (C). Dr. Bogdan Maglich (R) *(Photo: EFM)*

AR: Why is that?

RM: I'm saying that's what they'd said historically. Then I developed about, I don't know, 18 months ago, I worked out all the theory for this new gas phase cell and then Bill [Good] was working on testing it, and it works! And now we have people, you know, fighting to get in. I mean I get unsolicited calls from utilities, you know, I've got people coming who are CEO's and COO's and Chairmen of utilities flying up in their Lears [Lear jets] and coming here and wanting to license it.

Now, like I said, we have two term sheets already from two different big power generators, and we've got...just last week, I had three more utilities call me. I'm on the road constantly. I mean, the entire next week I'm going to be on the road every single day going to a different meeting.

So, you know, the whole tenor has changed, because now we have a commercially competitive process and I have people from Stone & Webster, Fluor Daniel, Westinghouse and, you know, a lot of big power companies who have said, "If you can get this new vapor phase cell independently validated," they said, "we feel that this will be the dominant source of power for essentially all-power applications."

AR: Right.

RM: Now it doesn't take a genius to figure out if you're getting a thousand times burning you can use a fraction of the electrical output to make the hydrogen out of water.

AR: Of course.

RM: And you're running very low pressures, 100 millitorrs, so it's safe and reliable. If you punched a hole in it, it would just suck air in and shut it down immediately. But because it's very low pressure you can control the hydrogen gas and the catalyst pressures and you can get very, very exquisite control on it. The mass balance is very, very low because you get a tremendous amount of energy per atom, and the product is a lower energy chemical form of hydrogen that doesn't burn, that's lighter than air. So it's very environmentally friendly, and it turns out that the capital cost is very, very low for the equipment also. And you can use existing power conversion equipment, because it runs at very, very high power densities and very, very high temperature. So it's like the ultimate power source.

AR: Well, it sounds extremely interesting and has a lot to do with the future of the planet as I see it, because a major part of our planetary problems is fighting over oil.

RM: Yes, do you want to talk about a really interesting.....we hired this guy, Jim Kendall, who's working out.....I mean in terms of your audience, I think this is really a fascinating concept that he's working on now for our system designs. We just hired him, we're very lucky to get him.

AR: What's his name?

RM: Jim Kendall. He's a Ph.D. engineer type and the thing that's really interesting is he's working on this concept.....it turns out the technology is already available, all the cars are out there in the parking lot. I don't know where you are now, but you know, you look at all these cars sitting around these parking lots, sitting in driveways, and all that. You know, a car is a very substantial power station! You could actually take an internal combustion engine and put a generator on it and you can run your car through electric motors, right—from an internal combustion engine? That's what these hybrid vehicles are.

AR: Yes, hybrid is so much more efficient than....

RM: Well, that's what they're talking about. They're actually talking about using some internal combustion engine with a generator and you have electric motors, right? Or they have fuel cells and people at Capstone [Corporation], for example, out in San Diego, is looking at like mini-turbine type of things.

Well, if you ran the internal combustion engine in that mode, you'd have so much carbon monoxide and all kinds of pollutants that you couldn't even breath. Secondly, the gasoline would be so phenomenally expensive and we'd run out of gasoline probably in about ten years, or twenty years.

AR: You mean if everybody in the world lives like we do?

RM: No, I meant if everybody ran their electrical generation off the automobile too.

AR: Right.

RM: But, if you are using *our* process.....gasoline's very expensive, relative to coal. The reason we have centralized power plants is because you have economy of scale for the fuel. Because you can take these huge truck loads and train loads of coal like the plant outside Harrisburg [Pennsylvania] uses 100 car loads a day at 100 tons per carload. That's a lot of gasoline, you know, if you are going to look at that equivalent. That's one power plant.

But the concept is you'd have one of these BlackLight Power cells, making maybe 200 kW thermal and then you'd have a hybrid vehicle. You'd put that into an external combustor gas turbine with a generator on line, so you'd make electricity, and you'd run down the road with electric motors, right? Then you'd park it and you'd plug your car into the grid and it would continue to run and it would generate about 40 kW electric that would go out on the grid. And you would get a credit for it, and then here at home when you are drawing down juice you'd get a debit and the utility company wouldn't even own a power plant. I mean, there's enough cars put out on the road in the United States to more than match the entire electrical generating capacity of the United States.

AR: I got your point. OK, that's very clear. So how close are we to actually producing a fuel cell working with this system that would....?

RM: It's not a fuel cell, it's a gas power cell. A fuel cell is actually a battery, You put hydrogen and oxygen in and then you've got to make the hydrogen. Now if you made hydrogen from electrolysis of water, you'd actually use about four times more fossil fuel than burning it directly. You follow me?

AR: I know that but I don't care about the words "fuel cell," that's right it's a gas cell.

RM: Yes, that's right, just call it a gas power cell, a hydrogen power cell. How close are we? Well, the theory's all worked out, the validations are worked out, the low energy hydrogen's been identified, that is a product, and we have power densities equivalent to many electrical power plants and running at temperatures comparable to many electrical power plants. And we're getting validated energy balance of a thousand times the energy of burning hydrogen. So we know the process works and now it's just the time it takes to retro-fit that into existing technology. We don't have to invent anything new. We're using vacuum furnaces and we're going to use external combustor gas turbines, so it's just a matter of retro-fitting it into existing technology.

So depending on how fast we are at executing that plan and how fast we are getting partners to push that agenda forward, it could happen very quickly. And the thing is, right now we're working on a 100kW thermal unit up at Thermacore at Lancaster [Pennsylvania]. Once we've got that, then you can put that into cars, you can put that into distributed power generation, that could meet [the needs of] developing countries where they don't have transmission lines—that could meet an *enormous* percentage of the market.

AR: Right.

RM: We're probably about six months from having that built.

AR: Six months from having that built?

RM: Right.

AR: Wow! Well, that is extremely interesting and I will let my brother know all about this and it's just fantastic.

RM: You'll be able to get some good stuff off the web. There's some summary there that you could kind of put into an article. We put up a couple of articles there, one that the Lancaster paper *Sunday News* ran I thought was a really good job, and the one that Reuters put out on the news wire.

AR: That's what I have.

RM: Yes, I think between all those, you'll probably get some good information.

AR: And if this is so then, in the next few years, systems will be developed that you spoke of—cars that can run on practically nothing for energy. Energy will be the cheapest thing in the world. Not as cheap as water, but I feel that we won't have a big problem with it.

RM: Well, fuel will be cheap. I wouldn't say energy would be— it's going to cost something because the capital equipment to create electricity or to create motor power. This makes thermal energy. Then you have to convert thermal energy into either motor power or electrical power. That requires a piece of hardware, and we're using existing hardware, namely gas turbines and steam turbines which are reasonably expensive. Compared to the fuel that the vehicle or the fuel that a power plant would use, whatever kind of power plant, the fuel outweighs the cost of the capital equipment, but albeit capital equipment is still a major cost.

AR: But that can come down. How would you say it compares with solar energy?

RM: Oh, solar energy is very expensive because the capital equipment costs are unbelievably high.

So you understand the basic process. We're taking hydrogen and we're making another chemical energy state of hydrogen.

AR: Yes. Now I don't know if anything is still secret if you are applying for a patent, presumably you reveal the secret, right?

RM: Yes.

AR: And so you've got one in Australia, I understand?

RM: Yes.

AR: So the secret isn't a secret any more?

RM: Not a secret.

AR: How then do you convert the hydrogen at low pressure, I don't know what temperature, to hydrinos? Then you've got the power and you have potassium as a catalyst, but what exactly do you feed into the chamber that makes this happen?

RM: You need atomic hydrogen.

AR: Which is separate from molecular hydrogen?

RM: You can make atomic hydrogen from molecular hydrogen by dissociation, which is a commonly-known process.

AR: Using an electric arc?

RM: You can make atomic hydrogen using electric arc, you can make it cheaper and more efficiently in terms of capital cost and energy balance if you make atomic hydrogen by just dissociating it on refractory metals at high temperature. If you take tungsten at elevated temperature, it will break—automatically break molecular hydrogen into atomic hydrogen.

AR: Something like the tungsten filament in a bulb?

RM: Tungsten filament in a bulb will do it perfectly fine. The tungsten filament in a bulb is in a vacuum and if you introduce low pressure hydrogen in there, a certain fraction of the hydrogen in that bulb will be atomic hydrogen.

AR: I got it. And then what happens?

RM: Then we take the potassium and you have to have it run very hot. So we run potassium ions, you need potassium$^+$ ions and hydrogen atoms. And we vaporize the potassium ions. We actually heat it up, everything has a vapor pressure, like this desk, the varnish on this desk. If you had a mass-spectrometer ion this room... everything in this room would have a vapor pressure. You heat these metals up, they boil off, and eventually....

AR: That all happens in a vacuum tube.

RM: You boil off and you get the continuous...well vacuum deposition is a commonly known process. So you are in a vacuum, you heat up the potassium, it vaporizes, contacts hydrogen atoms, and there is a resonant transfer of energy, that is, there is a match in the energy level of the hydrogen atom to the difference in energy of two potassium ions for the reaction of electron being transferred from one potassium ion to another.

The potassium ions have other electrons that can be ionized. If you take away the second electron from one potassium ion, and cause that electron to reduce from the first potassium ion, so one goes to K^{2+} and the other one goes to K^0. The energy to do that is 27.2 eV. That is the potential energy of the hydrogen atom when it's in its first non-radiative state. You follow me?

So the potential energy of the hydrogen atom is equal to the energy for transferring an electron from one potassium$^+$ ion to another potassium$^+$ ion. So that hydrogen atom forms that potential energy state spontaneously by emitting light and you can have it form other stable non-radiative states by transferring, in this case *non-radiatively,* 27.2 eV to something else that will accept 27.2 eV.

In the process the electron in the hydrogen atom undergoes a transition to another stable state and part of the energy is transferred resonantly to this catalyst, the rest of it can come out as radiation if you are in a vacuum. In fact, you can see this in those extreme UV lines in solar flares, in the solar corona, you can see it in the dark interstellar media. There's quite a lot of spectroscopy of unassigned lines in the extreme UV from astrophysics, but those transitions match exactly. That is the transitions of taking some of the energy out of hydrogen and it becomes unstable and emits the rest as light. The energy levels are given by the Rydberg formula, which describes the principal energy levels of the hydrogen atom, and the transitions between those principal energy levels gives the light frequencies that come off spontaneously. Those states correspond to the integers in that formula and the states that we're talking about correspond to *fractions* in the same formula.

It's not any fraction it's 1 divided by I where I is an integer. Those are the fractional states. So you have one-half, a third, a fourth, a fifth.

AR: This is physics/math that I don't really understand. What I want to know is something I can more understand. What then happens? You have a combustion chamber of a certain size?

RM: You can think of it as a combustion chamber when you think of a gaseous reaction like inside the cylinder of a car, but this would be much lower pressure. It would be very hot like right after the ignition inside the cylinder. So a vaporized catalyst; then hydrogen atoms that have formed because there's a refractory metal like a tungsten filament is very hot, it breaks molecules into atoms; they contact the catalyst; and by contacting the atoms with the catalyst, energy is transferred from the hydrogen to the potassium, just as when we contact hydrogen atoms and oxygen atoms you get combustion. If you contact potassium ions and hydrogen atoms you get hydrogen going to a lower energy state. The potassium takes away part of the energy. It gets hotter in the sense that it goes to a high energy state. It gives off that energy to the system and returns back to potassium ions, so it serves as a catalyst.

AR: In the vacuum, how does the hydrino then go off, or does it stay until you somehow take it out?

RM: Well, once you've formed fractional atomic hydrogen, it has what we call "binding energy," that is the energy it takes to remove the electron to form a free electron and a proton. It has a binding energy that's a multiple of 27.2 eV. So remember when I told you we had to observe 27.2 to cause the catalysis of hydrogen to the lower states? Well, once you have formed the hydrogen itself in that lower state it has a binding energy of a multiple of 27.2, so it can become its own catalyst. So it becomes auto-catalytic.

AR: The hydrogen atoms gradually become hydrinos?

RM: Yes and they become auto-catalytic to form lower and lower states of hydrinos until one of two things happens. Either two hydrinos react and form a di-hydrino, a molecule, which is stable and doesn't burn and we haven't seen any chemical reactivity at all from this new form of hydrogen, or it's so small it just diffuses out of the system.

AR: Through the container?

RM: Right through the container—as if it's much smaller than helium and it'll go right through the container.

AR: Much smaller than hydrogen atoms too?

RM: Smaller than hydrogen atoms, smaller than helium.

AR: Through the spaces between the atoms?

RM: In the container.

AR: So how does it get out?

RM: Just as if you had a balloon and if you fill it with helium after a while the gas will leak out of the balloon. Because the atom is small and it's neutrally charged so eventually it leaks out.

AR: But hydrogen is still smaller than helium?

RM: No, hydrogen is bigger than helium. The one-half hydrino is about the size of a helium atom.

AR: One half-hydrino, a hydrino that hasn't lost all of its activity...

RM: No. We have normal hydrogen, so let's talk about the fractional states. We have normal hydrogen. Normal hydrogen has a principal quantum number of n is 1 and that has the size of the radius of the hydrogen atom which is 5.29 times 10^{-11} meters. And helium is about 0.56 that size.

It's about half the size. Now the hydrino, one-half, is half the size of normal hydrogen, or 0.5 the radius of the hydrogen atom.

AR: I see, so it's like a helium?

RM: Very close to the size of the helium atom.

AR: I never knew that heliums were smaller than the hydrogen atom.

RM: Helium atoms are smaller.

AR: OK, because they have neutrons, I would assume.

RM: What does? Yes, but that's the nucleus. The nucleus has neutrons, but the electron is what determines the size.

AR: I get it, so the orbital size of a hydrino is much smaller than that of a hydrogen atom?

RM: Half the size, yes. And then if you go to one-third, it's one-third the size, one-fourth—the lower and lower you go in energy it gets to be a fractional size of normal hydrogen.

AR: Now what gives a thousand times the power of burning hydrogen?

RM: On average we are going down to the (1 over 10) to the (1 over 20th) level of hydrogen. So we'd have a hydrino say (1 over 15). That would be the quantum number that goes into the Rydberg formula to describe its binding energy. That is the energy it takes to remove the electron. Actually this formula goes back to the 1800s, 13.6 over n-squared [$13.6/n^2$].

All the energy levels of hydrogen that are spontaneously radiative fit that formula where the n is 1,2,3 etc.—an integer.

AR: Again, we're talking mathematics

RM: But, this is important to understand, because you are talking about the size and I'm talking about fractional quantum numbers that go into the energy formula are the same fractional numbers that describe its size relative to hydrogen.

AR: So the container that you have, the stainless steel container....

RM: You can use stainless steel, yes. You can use molybdenum, or tungsten, or stainless steel. You have to run this at very high temperatures, so you need something that will run at high temperatures. Stainless steel is pretty good.

AR: Would you use a ceramic?

RM: No we'd use either molybdenum or tungsten.

AR: Tungsten can stand very high temperatures?

RM: 3,000 degrees centigrade.

AR: So, does it happen that the container heats up to temperatures like 3,000 degrees?

RM: The container that we have, the one we have run, we had a center line of 2,000 degrees C and the outer stainless steel part of it was 850 degrees. But the one we're designing now, the container wall itself will be at 2,000 degrees.

The container that we have, the one we have run, we had a center line of 2,000 degrees C and the outer stainless steel part of it was 850 degrees. But the one we're designing now, the container wall itself will be at 2,000 degrees.

AR: That heat is taken off by....

RM: Heat exchangers and then it can be used in a gas turbine. And the gas turbine can be used to turn a generator, or generate motor power. Standard conversion.

AR: OK, if you've got heat, there are ways to produce electricity?

RM: Yes, this is a cheap way of making heat.

AR: You continue to feed in hydrogen and does all the hydrogen you feed in at a controlled rate come out, change to hydrinos or just a fraction of it?

RM: A pretty large percentage of it.

AR: But the rest would tend to flow out the chamber right?

RM: What we feed in there ...... we've done batch studies where you put in hydrogen and leave it in there till the reaction stops. So all the hydrogen in that cell is eventually consumed to make hydrinos.

AR: I see. And you just let the hydrinos go......?

RM: They diffuse out eventually, yes.

AR: Eventually, can the process run continuously?

RM: It can run continuously, yes. We've done that. Where you feed in new hydrogen.

AR: At a controlled rate, just as fast as it's needed?

RM: So you have very low mass balance... because you get a tremendous amount of energy per atom so you don't need very many atoms.

AR: Right, I understand. Then the next step is to get efficient use of the heat that's produced and engineers have worked at that for a long, long time.

RM: That's correct, we are working on that now. There are a lot of really interesting technologies to which this lends itself. One of the things we're looking at—we're looking at a couple of scenarios. Of course, there is retro-fit of central power plants, where you just take the existing boiler and you put in our gaseous reactor that converts hydrogen to lower energy hydrogen and generates power large-scale and turns either a gas turbine or a steam turbine to make electricity.

The other scenario is that we would look at distributed power, or we make maybe one-megawatt units and we put the little power generators out at the locations where you have sub-stations today and then they would generate power for, say, 200 homes or several businesses.

AR: Assuming, water is available, does the water have to be specially pure?

RM: No, any kind of water will do. As long as it's water that has hydrogen in it. Heh, heh!

AR: I lived 12 years in Paraguay and I've been in other countries, Cuba for instance, which is much, much more advanced than Paraguay.

RM: Yes, I'd say so, they're kind of having some economic problems right now, but you know more about that than I do.

AR: They had severe economic problems three or four years ago, they are pretty well over that.

RM: That's good news.

AR: It's great and everybody is educated.

RM: That's a good point.

AR: Everybody can read and they would jump on this energy system!

RM: They're probably in need of energy, especially since the Russians kind of cut back on their supplies.

AR: Right, they've been thinking of finishing this nuclear power plant that was started by the Russians......

RM: I'm afraid they don't have the technology.

AR: They do need energy and they have energy, but nowhere *near* what they need and I don't know if you'd be, at what point, maybe not now, but at some point, you would be willing to allow Cuban scientists to come here and.....

RM: Well, I'd have to look into that. I think there's some export restrictions still.

AR: Oh yes, export you can't...

RM: On a scientific basis, I could talk to them. Export -- I think there's still restrictions.

AR: I've got the Government restrictions here. I've got the Treasury Department stuff and there's huge loopholes, you know you could fly a Cessna through the loopholes. What's prohibited is doing business. Every other country can do business with Cuba, but we can't.

RM: So you could probably do business through the other companies in other countries.

AR: If you are established with any other country you have no problem. But scientists, can scientists come here and learn everything and do the work there, but maybe not be able to pay you. That might be the problem.

RM: Yes well, not that we had patents in Cuba anyhow, I don't think they're PCT signatories. Anyhow, have you got any more questions?

AR: Yes, I have lots of questions. The thing that surprises me greatly is that the military of this country hasn't come down on you and said: "This is a military secret."

RM: Well, I think it's still controversial. I think in time the military will see some applications to it, but right now we aren't working with the military. We don't contemplate it at any time in the near future. We're just working on developing it as a new civilian type of energy source in a business perspective.

AR: I've heard rumored, I don't know the facts, I heard rumored that some other inventions have been concealed in that way.

RM: No this one hasn't.

AR: Right. And from what I understand, from what you've already told me, when the patent is published here, presumably anybody could view what you are doing?

RM: That's correct. Under license they could.

AR: But to be legally doing it, it would have to be licensed?

RM: That's correct.

AR: But the information would be out there and if they chose to do it illegally, you couldn't stop them except by suing them.

RM: That's correct.

AR: But, at the same time, it's clear that ultimately it will be possible for the people to have it, whether big corporations do or not?

RM: Yes, we're working on these two distributed power schemes—personal units. You'd have one for your home, you'd have one for business and office and the other one is clustered—what they call distributed power and that is when you have a unit, say at the sub-station, which may feed 20 businesses or 200 homes, this is the megawatt unit which will feed up to 200 homes.

And then the other form of individualized power that I like the best, for the long term, is that an automobile could have a generator that could generate about 100 kW electric and there are 10 million new vehicles made a year which would give you a thousand billion watts. Now the total electrical generating capacity of the United States is only 600 billion watts. So every year you have new cars coming off the assembly line, and when you park your vehicle you would plug the wire into the grid and it would generate 100kW electricity and you'd be paid for the electricity.

AR: And what that means to me, and it would mean to other countries is that one vehicle in a village could supply power for the whole village.

RM: Yes that's correct. In fact, 100 kW is a lot. 100kW could heat about 20 homes, American homes.

AR: So it means that you'd have a mobile power station and one could drive out to every village in every country of the world.

RM: Well, if you look around at the parking lot—you go down to Philadelphia—people have $20,000 to $30,000 dollars investment in [their] cars and it's not making them any money. They are using them 3% of the time. They park in a garage or in a parking lot. You'd have a strip running down the parking lot to put the cars in and there's a system already that will recognize which car it is and give you a credit, while you are selling juice back to the power company and when you use this electricity you'll get a debit.

So electrical utility in the future will be more or less like a re-seller of power. You can generate more than $10,000 worth of electricity with your car and you could do that today if you put an electrical generator on your car. The problem is that the gasoline would cost more than what the coal cost to make the electricity. It would make so much pollution, we'd all die of carbon monoxide poisoning.

This could make that happen. It's all in place, I mean the power conversion equipment, you can step up the voltage, step down the voltage, change the frequency—all that's in place.

AR: I know all that stuff.

RM: The computer technology to handle all the debiting and crediting and...

AR: My question is this...how long will that power plant hold up, before one or more of the parts deteriorate from the heat and have to be replaced?

RM: Well, that's a good question. Those questions are things we have to answer. There aren't any moving parts, so it should be possible that that shouldn't be the weak link. Now, if you do look at the next weak link, the turbine—mini-turbines. They will run a phenomenally long time. At least for motor power applications. Capstone [Corporation] for example, is looking into putting turbines in to replace internal combustion engines using fossil fuel. And, those turbines should last a lifetime. Turbines run for an extremely long time.

Your next question was about electric motors. Well, electric motors are very, very resilient also.

AR: My question is what about your generating system for producing the heat, how long will that hold up?

RM: We don't see any problems with it being a weak link in the technology.

AR: That answers my question. So the stainless steel system, which is the cheapest that you've mentioned, could hold up a lifetime and not get burned out, corroded...

RM: Well, we are working on that, but we don't see any problems with that kind of thing.

AR: OK, so that's a developed field that would hold up?

RM: And there's no moving parts in that. You have the heat exchanger, the vacuum vessel. Then we have the electrolyzer and for the amount of hydrogen we'd have to electrolyze. For example, a tank of water would would be worth a thousand times the energy of burning hydrogen—which we are seeing in the lab now and we have that independently validated. The tank of water could run a 200 HP automobile going 60 mph and a tank would take you 100,000 miles.

The electrolyzer doesn't look that that's going to be a weak link either, it doesn't need to run much hydrogen.

AR: I was going to ask the question how airplanes would work on this?

RM: Well, they'd probably use a turbine engine, but you'd have to make a very high powered and very compact heat exchanger and the same way the gas turbine would work in the automobile you'd have a gas turbine in the airplane.

AR: This is just a total revolution for the planet.

RM: It is, it represents an unbelievable....if you are going to design an energy source, you couldn't design anything better.

AR: Exactly.

RM: Because the planet is essentially made out of water, you would use very little, and the amount you would use up would take thousands and thousands of years just to remove the water from the biosphere that the burning of fossil fuels put there in the first place.

AR: We wouldn't have to worry about the water situation—the oceans are full of it.

RM: Plus you've got billions and billions .....inexhaustible.

AR: My operation is a shoestring operation. Somehow if I work for the universe, the universe works for me. I have an income, from a trust my mother left of about $12,000 a year, and I have a family of four and people say, "How do you run an airplane on that income." Well, people donate. You know, we got a $1,200 radio in the airplane just recently donated by ICOM. And I'm looking forward to a donation of a good GPS [global positioning satellite receiver] and there are various people who are interested in what I'm doing. When they read about this, they donate more.

This means everything. I'm observing the planet in ways that they are not able to do at this time and people appreciate it and they help me.

[This is the end of the personal interview, then AR took some pictures and now here is another phone call with Dr Mills. After the in-person interview, I called Randy Mills again:]

RM: Oh, how are you doing, Art ?

AR: Better and better, except I just learned that there's an air-worthiness directive on my old Cessna [airplane] and that's going to cost me over a thousand dollars.

RM: Oh, God I hate that.

AR: Do you fly ?

RM: No, I was just being facetious.

AR: The reason I'm calling you is to try to get you to just tell me the story of how you discovered this new form of energy.

RM: OK, I was working on the theory, you know that theory, I gave you that book, and I applied that non-radiative boundary constraint to the hydrogen atom.

AR: What led you to work on a new theory?

RM: Well, because I knew the old theory was wrong. It doesn't work. It causes a division between classical, you know, the large scale physics, and atomic physics. And Bohr, back in the early 20th century said he couldn't get the theories to work out and be in agreement with classical theories, so he just said it just obeys different physics, which was a very bad move. And we've inherited that ever since. So what I said is physics has to apply on all scales, because everything is made out of atoms and the laws that apply on the large scale must apply on the atomic scale. It's just that since they did not solve the equations correctly.

AR: Did that lead you to this electrolysis experiment?

RM: Yes. So what I did was I went back and I solved the atom by invoking a constraint— in other words, whenever you solve the atomic equation you have to have a condition to solve it, a constraint. There is an infinite number of solutions to the wave equation. So I picked as my constraint something that you'd observe all over the universe, that is hydrogen at the 13.6 eV energy level, is non-radiating. So I said I will solve the atom with the constraint that it doesn't radiate at that energy level. And the atom solved in closed-form without any postulates or fudge factors or added-on junk that they have today. And it matched all the various measurements that have been made on the hydrogen atom which permitted me to solve the electron, that is the free electron, the photon, excited states of atoms, and it also predicted that there are these other low energy states of hydrogen that involved transitions without the release of radiation.

AR: What you are saying is that you started out then from the mathematical point of view?

RM: A very sensible theory—derived the solution to the atom, it predicted these other states of hydrogen and how to make these transitions occur. That is, I had to use a catalyst that would absorb the exact amount of energy 27.2 eV and I looked in the literature and said, "Oh, look, potassium has a reaction that can absorb that amount of energy." And then I ran the reaction. Simple as that, it's all from theory.

AR: I see. You started out to be a *medical* doctor, is that right?

RM: Yeah, but I invented a lot of cutting-edge technologies and I was always in the high-tech end of things and I took an electrical engineering program at MIT simultaneously.

AR: We know that. I see that in your biography.

RM: Then, that's why I picked up on this non-radiative constraint from one of my professors who was working on free electron lasers. Then I applied that to the atom and solved the atom correctly. And by solving the atom correctly, I found that there are these other states of hydrogen that could exist and how to make those states in a reaction.

AR: How come if the normal state of hydrogen as we know it has more energy, how come that so much of it exists at the *higher* energy level?

RM: Because that is the first non-radiative state. That means you can't get it to go to a lower energy unless you take energy out of it by a non-radiative mechanism. In fact, normal molecular hydrogen forms without emitting light also. It has to have some third body take away the energy, namely the bond energy, for molecular hydrogen to form. So it's the same principle. In fact, if you look over the entire universe, you'll never see light being emitted from molecules forming from atoms of hydrogen.

AR: With other atoms, that happens?

RM: Well, I don't think it happens with any atoms. I had a chemist in here the other day and he said, "You know, I think that's true of *all* atomic reactions that form molecules. I don't think there are any of them that emit light. That they have to have a third party. You know in molecular reactions."

AR: So, you started out as a medical doctor working at the high-tech end of inventing new medical procedures.

RM: Not procedures, new medical technologies. Pharmaceutical technologies and medical imaging technologies, things of that nature. And I was working on *theory* to predict new technologies and I went back and I re-worked atomic theory correctly. And it predicted this new source of energy by making a form of hydrogen that exists in nature, but no one knew how to make it or was aware of its existence.

AR: So hydrinos do exist naturally?

RM: Yes, they make up the dark matter and they—it accounts for part of the energy, about 40% of the energy coming from our Sun, for example. It accounts for the flares that you see in the Sun.

AR: Flares?

RM: Solar flares. The mechanism behind that is these lower energy hydrogen transitions.

AR: Tell me something else. Some people who claim to be scientists, although I don't know if they really are, say that it isn't possible for people or animals to get all the energy that they have simply from the oxidation of food; that there must be something else that goes on in the body that gives us our energy.

RM: Hey, I'm not sure about that. Well, if you get me some literature. I mean I've never looked at—I know you can put people inside a closed chamber then you can feed them and figure out how much chemical energy is there and measure all the heat they give off, etc. I don't know. I've never looked at that data, maybe they're right, maybe they're wrong. I'd have to look at the data.

AR: What I've seen of it isn't scientific enough to...

RM: It's probably not accurate enough to tell. So, you really can't comment on it then.

AR: Right. My theory is that if you took all the food that someone ate normally and burned it in pure oxygen you'd get a certain maximum amount of energy from it.

RM: That's correct, from thermodynamics.

AR: Then if you took the work that that person does physically and determined how much energy he puts out, if he's putting out a lot more than you can get by burning the food, then he must be getting it from some other source.

RM: You could do that experiment by putting him into a closed environmental chamber and seeing how much heat his body releases.

AR: Right, but I mean the heat is minimal compared to the physical work.

RM: What I'm saying is by moving things around, that mechanical energy has ultimately got to be converted into heat.

AR: So, you were working at inventions having to do with medicine and healing and you came upon...you started working on the mathematics.....

RM: Of atomic theory...

AR: Of atomic theory, and finding that the theory was evidently wrong.

RM: Yes.

AR: And it's not only your discovery but other people have seen so many inconsistencies.

RM: That's correct.

AR: That you had to say there must be something wrong with this whole mess. Einstein saw that.

RM: Yes, Einstein saw right through that at the very beginning.

AR: And he said that his theory was, at least, not complete.

RM: He was correct though. His part of it was correct and his intuition was correct, but he couldn't finish it. I think I've finished what Einstein's dream was.

AR: Right. And yet—but people seem to doubt—so many other scientists seem to doubt that hydrogen could have a lower energy than what they call "the ground state."

RM: Well then that's OK, because this-—you know—is something that's really quite new and it's been ingrained in them that there is something called "the ground state," and the reason they're ingrained with that ground state is because that's a postulate of quantum mechanics in order to solve the hydrogen atom.

In other words, the theory— they invented the theory to match what their conception of the hydrogen atom was; it dates back to 1886. Because they had some data that said here's a hydrogen that goes into this lower state, so we'll make a wave function that has that as it's lowest state, but it didn't have any physics built into it, it wasn't based on physics, it was just a mathematical model. It didn't have to do with physics. Because remember they said that physics was different on the atomic scale.

AR: Right.

RM: So people have been taught that 13.6 eV is the lowest, or the ground state of the hydrogen atom, but in fact it's not, there's no reason why it can't go lower. In fact, the potential energy between the proton and the electron could release a million extra electron volts of energy. And it *doesn't* and you ask, well why can't it go to these lower states, because it does it spontaneously when you form a molecule of hydrogen, it goes to the lower states when you form water? The reason it doesn't is because that's the first non-radiative state and that's the condition I used to solve the atom correctly. Do you follow me?

AR: Well, more or less.

RM: Well, let me put it this way. Around 1900, scientists said well, we've got some spectra that we see hydrogen has this state that we feel is the lowest energy state. So what we're going to do is we are just going to make a mathematical—we're going to describe the hydrogen atom. The same way you would use words, they use mathematics. They said the hydrogen atom is 13.6 over n-squared [n^2], where n can't go below 1. They just proclaimed that. Didn't have anything to do with physics, just proclaimed: "That is the ground state." And what I did, is I said, "*No*, it's physics! If you go back and solve the problem from the principles of PHYSICS, the electron can, in fact, go to low energy levels and you just haven't FOUND it yet."

So, if they found the hydrogen in one-half state, they'd just say, "We *proclaim* that hydrogen can be 13.6 over n-squared where n is one-half, one, two, three, four, five—you know, up to n is infinity. They just found it in that state and they just said we'll proclaim it. Now, you can describe it in words, or you can describe it in terms of mathematical formulae, both mean the same thing. You follow me ?

AR: Yeah, I follow you, without the math, I'm not that good at math. Physics is a hobby of mine. I...

RM: Well, all I'm saying is that they found hydrogen in a certain state and whether you describe it in words or in a mathematical equation that is equivalent to words, they just said: "I proclaim hydrogen is—and they set this out—said that's what it is. And what I'm saying is if you solve it correctly from first principles of physics, it says that is not the end of the story and that is not the full description of what hydrogen is.

You have these other states that you can cause to happen by a non-radiative mechanism. And that's what I did, I solved that and I went into a lab and tested it and it made energy and then I did some experiments that showed that this new form of hydrogen exists, and then I looked in the literature and alas there is a ton of data in the literature that supports the existence of this new form of hydrogen and explains many, many problems that before could not be explained.

AR: You say there's a ton of data in the literature?

RM: That's correct.

AR: But have you got specific literature in mind.

RM: Look on the web page, **[www.blacklightpower.com]**. There's a ton of it, there's things from solar flares, there's light from interstellar media, there's transitions in the solar corona, there's microwave background from deep space, there's been nuclear hyperfine transitions, there's proton atom scattering, that shows a back-scattered electron peak that has the characteristic feature of being caused by a one to one-half fractional hydrogen transition. There's a lot. But look, my wife's waiting on me. I've got to run home now. Well, ring tomorrow if you want to talk some more.

[The final phone interview: June 19, 1997]

What led to the discovery?

AR: I want to ask you a bit about your life and what led you to take on the career that you took on ?

RM: O.K., I'll have to think about that.

AR: Naw, you really know it all.

RM: Yeah, sure.

AR: I mean you might want to think about what you tell me — sort of informal — I don't want a whole bunch of details or anything.

RM: OK.

AR: If you could tell me a little bit about how you came to be in that situation—that you wanted to be an inventor. I wanted to be an inventor too, but when I was a teenager I discovered that most of my inventions would be used by the military, or something .

RM: Well, I just decided that's what I wanted to do, and I just stuck with it and did it, to put it succinctly. You know, like a person would want to be a doctor, or a lawyer, or a dentist. You just work through all the issues, and just keep focused and do it.

AR: What led you to want to be in that field?

RM: I enjoy it. It's like anything. If you try tennis and you like it, you try and do it as much as you can, and I decided I wanted to do it as a business.

AR: Did you have any medical problems in the family or things that led you to go into that?

RM: Not really. I just decided that was what I was interested in.

AR: As an inventor, or as a healer?

RM: All of it's the same to me, whether you're inventing medical or inventing energy. To me there's no such thing as a specific discipline. I think that's kind of an artifact of just the way the educational system is. But I don't see any sharp boundaries between medicine and energy and physics and electronics or anything. I think they're all interrelated.

AR: All healing is a matter of healing the planet.

RM: Everything's interrelated. Sure, I mean the chemistry that goes on in molecular biology—some of the concepts can be applied to atomic physics to cosmology. I mean, they're all basically working with similar types of reasoning processes.

AR: How old were you when you first decided that you wanted to be an inventor?

RM: I started working when I was, like, six.

What is the Aquarian Research Foundation?

(Finding ways to a positive future for the earth since 1969)

by Art Rosenblum

About sixty years ago a young schoolboy asked his teacher, "What is the purpose of life?" She said: "The purpose of life is to have the highest possible standard of living." He was dubious.

Some years later at a small Christian college in Ohio, he asked fellow students, the same question and was told that no one, not even the professors could answer it.

Then at a Quaker meeting Art heard of 600 people in Paraguay, South America who lived together, did not go to war or work for money but shared all property. He sensed those people might have an answer, and asked the college dean who replied: "A year at a place like that is worth more than a year at any college."

After about 20 years of voluntary poverty in that and other communities, and full time work for world peace, Art Rosenblum came to Philadelphia with fifty dollars to learn how this planet could have a positive future. Thus began the Aquarian Research Foundation. Lawyers volunteered for a tax exemption in 1970.

Aquarian, has no corporate or government funding so is free to search in all directions. Science and aviation are Art's hobbies. He flys a 1958 Cessna to where new things are happening, even to certain Carribean islands when necessary.

For years he sought answers to the energy problem. Arthur Young, inventor of the Bell Helicopter financed a cross country trip to check on one but it was a fraud.

In Paraguay, Art made electricity from charcoal gas. He saw many marginal solutions like wind and solar. He's an inventor type himself with a patent that makes it easy to land aircraft, but he has no time to market inventions because his real passion and unpaid full time work is a positive future for the entire planet.

Judy joined him in 1976 and, working together they raised two children, a writer/editor at 18 and a computer whizz nearly 13, who's also a prize-winning writer. Still they live on a shoe string and depend on miracles to keep going.

Computers, parts and maintenance for the Foundation's 1958 Cessna, automobiles, even some telephone service is donated by people and companies that understand the need for future research and want to keep it going so new discoveries as positive as the work of Randell Mills will not remain hidden from public view. Concerned people who provide those miracles receive Aquarian's newsletter about 10 times a year and tax write-offs from IRS.

Subscriptions to Aquarian Alternatives are $25/12 issues. Sample copies are free with stamps and a return label. Other articles, audio and video tapes are also available as well as the actual taped interviews with Dr. Mills.

Aquarian Research, 5620 Morton St., Philadelphia, PA 19144-1330 is for letters. e-mail is <artr@juno.com> and phone is 215-849-259 or 849-3237 day or evening.

We may be away most of March, so February is the best time for contact.

AR: Really?

RM: Yeah, pretty young.

AR: With what kind of things?

RM: I wouldn't want to mention—they were pretty far out. I think we ought to stick to the things we actually got working.

AR: I see. Someone wrote the following: "For the sake of argument, let's accept that this is true (meaning BlackLight Power works). What are the plans for this wonderful new energy source? Is it to be held in the hands of Dr. Mills, who would surely become the richest man in the world overnight, if it were, or, is Dr. Mills beholden to some corporation or consortium, or, are there plans to make such wonders available to all, like the air and sunlight that surround us as a right of mankind?"

RM: Ah, well, that's kind of a Utopian dream, but the realities are, when you commercialize something, someone's got to pay for the hundreds of millions in development costs, the infrastructure changes, and it's got to be organized as a business. You know, penicillin wasn't developed, except by the military, because it was "given" to the world and then no one could get patent rights on it, so no one wanted to spend the money to develop it, because they couldn't derive any revenue from it. So, I've got shareholders I have to answer to, and corporate investors and the like. But, if you believe in the free market system, if it's the best energy source, everybody's going to get it at the cheapest price. That's basically the way the system works. And I think it is competitive to coal and gas and nuclear power. And, in time, you're going to see everyone's standard of living come up and the environmental issues improve as a consequence of the introduction of this technology and adaptation of it.

AR: Right.

RM: If you're asking, I've got about 160 shareholders. It's a private corporation, but we're intending to take it public, which means that anybody can buy ownership in the company, in other words anybody off the street could own shares in it if they had the money to buy the share price, and the units it will be in, it will be relatively affordable to anybody.

AR: Any idea when that might go public?

RM: We're trying to get it done in 18 months. I mean that's kind of the business plan, but we can't guarantee anything.

AR: Right, but in the meantime do you expect to have a powerplant running ?

RM: We're working on prototypes, you know, on the cell itself and also on—the prototypes on the cell — we're looking at conversion equipment right now. We're trying to do some research into that, what would be the most effective conversion equipment.

AR: To convert the heat to electricity?

RM: Yeah, it looks like maybe turbo-generators look like to be the forerunner right now, but that could change.

AR: And are you working at all on mobile systems yet ?

RM: Sure. Yeah, as a matter of fact there's some real good synergies between the mobile and distributed applications—the equipment required—so there could be shared development costs and increased markets, that type of thing.

AR: What about the poor countries—presently poor countries of the world—-where they have no electricity? Would you see this as being made available at a price people could afford in those places ?

RM: It's probably the only thing that would really work for those countries, because they don't have the infrastructure for fuel and they don't have any central grid, and they don't have the economy to put any of that in. So deriving the hydrogen from water from part of the energy of the process, and then having a small compact unit that's relatively simple, is probably the *only* solution for them. In a lot of countries I think this would be very, very beneficial.

AR: Right, I can see that. As I said, I've lived 12 years in the jungles of Paraguay and the remarkable thing is....

RM: You don't have any fuel, you don't have any wires, you don't have any engineers there, so if you can just drop in, parachute in a self-contained unit that's relatively simple — you know the advantages of that.

AR: Where I came to was a Christian cooperative community of 600 people and they had a couple of engineers, and they had steam engines after 8 years there, and they had electric light all through the village, whereas the Mennonites who'd been there for thirty years already, could not do it because they would have had to have electric meters in every house. And the cooperative community didn't have to worry about that because nobody paid anything.

They had electric light. It was a very impressive sight, the night that a Mennonite brought me first to his home a few miles away and I looked in the direction we were going and there was a glow in the sky which wasn't the Moon, and I said, "What's that ?" He said, "Oh, that's Primavera. They have electric light."

RM: Wow !

AR: It was very impressive !

RM: Yeah,

AR: So, I got there and they had these ancient steam engines, and the newest one was from 1905 or 1913, the German Wolfe, but the old one was from 1898, and still running! And we built a charcoal gas engine system to do it a bit safer. Anyway, the other question is that an engineer that I was on the phone with, who works with a lot of physicists in the field of cosmic rays—and I mentioned to him that I thought you said that hydrinos could capture the energy from a cosmic ray and revert to hydrogen atoms.

RM: Yeah, but that's a rare event.

AR: A rare event, but he said cosmic rays are essentially protons, for the most part.

RM: Yeah, but if they smash into a hydrogen atom, they can knock the electron loose. Hydrogen or lower energy hydrogen. I don't think anybody would refute that. No matter what the electron is, a cosmic ray will ionize anything. They're very high energy. So they just smash into something and rip the electron loose.

AR: So, it would not restore it to a hydrogen atom?

RM: Yeah, it wouldn't, but once you ionized it, then the electron would be captured by—see, you'd have a free electron and a free proton then, and of course it would form a hydrogen atom.

AR: So that could actually happen. But it would be a rare event that we don't have to really worry about.

RM: Well, no, it would be a good thing, right, because then it would block the cosmic ray somewhat, and it would just revert back to normal hydrogen, so it wouldn't screen some of the cosmic rays, albeit it's not going to have much of an effect, because there's not much of it, and the cross-section what they call—the chance that a cosmic ray will hit it, because it's real small—is low.

AR: Right. The other question—if hydrogen is not at its lowest energy state, how could there be so much hydrogen in the universe, and around everywhere at this high energy state?

RM: Everybody that I talk to has missed that. That's such a common question. You know, well, 95% of the matter that we see is hydrogen. Why isn't it in a lower energy state? Then you've got to point out to people that the 95% of the matter that you can see, that's hydrogen, that only represents 5% of the total mass of the universe, from what gravitational measurements have been made. So, what's this other 95% of all the matter in the universe? What *is* that? Well, that's lower energy hydrogen, also. I mean, that's hydrogen, but it's in a lower energy state. So, there is a lot of it, there is an awful lot of it in the universe in this lower energy state. You know what I mean, you're only seeing the tip of the iceberg.

AR: Right, so, is it also present in our atmosphere and everything?

RM: No, it's lighter than air, so it's not in our atmosphere, but it does make up a very large constituent of the mass in the universe, and there's a lot of it in the sun. It's being produced in the sun. And that's where a major fraction of the energy is coming from, by this transition reaction occurring in the sun. Namely, if you look at the spectra of the sun, there's a bunch of lines that haven't been assigned that match the Rydberg formula, which is the energy levels of the hydrogen atom, with fractions, rather than integers. That is 1 divided by I, where I is an integer, substituted for n-squared [n^2] in the denominator of the equation. That gives you very high energy levels in terms of the energy of the light coming out from these transitions. And that's seen from the Sun. It's seen from interstellar media; it's seen from solar flares, etc. So, it's just a matter of misidentification or lack of making the connection between spectra, a very large constituent of matter that could not be identified, and lower energy hydrogen. If they had made that connection, then they wouldn't ask that question. But, not till now has anyone done that.

AR: Caroline gave you a disk of the material on cold fusion that came in from the internet.

RM: Yeah, I don't really pay much attention to that.

AR: Right, and the problem [you say] is that they don't understand how the energy comes, where it's coming from?

RM: Well, I don't even know if they're getting energy. I agree there are some experiments done in very reputable labs that said they're maybe getting 10 or 20% heat from palladium and lithium electrolysis. And, it turns out that palladium^{2+} and lithium^{+} is a transition catalyst. So, you could get some hydrogen transitions, get some heat, and then the nuclear products. But, then, there's a lot of junk on there, talking about everything in the phone book—transmutating the periodic chart, a lot of really strange stuff that really isn't—I don't think —well done experimental work. You know, like, there's a company, CETI, and they were saying out at the Power Gen Conference [1995] that they had a device they could show in public that was making a thousand watts. And now, in the paper I looked at that you showed me, they are saying, "Well we may be getting 10 to 50% excess power." And that makes me really question their credibility. And they said they were getting a thousand watts with, like, a few milliwatts input, which is tens of thousands of times multiplier. And, now they're saying, well, we're only getting 10% excess heat. So, what happened in between? So, they really lose a lot of credibility, and you really trust what they're telling you as being accurate.

I haven't seen independent research labs saying that either, and that's the difference between us and those. Because we have top, credible labs saying, "We've independently tested this, we tried to disprove it, and it really does work." That's a big difference, rather than them, themselves, who are selling it, trying to raise money from investors, saying... "Yeah, we're getting a kilowatt," and then not getting anybody to independently test it, and then later saying, "No, we're not getting a kilowatt from a milliwatt in. We're really putting a kilowatt in and we're maybe getting a 10% excess energy on top of a kilowatt," which is really within the experimental error of measuring heat.

AR: When I read the stuff, I also saw mention of yourself.

RM: Yeah, they tried to latch onto what we're doing and pull us into that, but I don't encourage that. I condemn it rather than condone it, but there is a free press, and they'll do what they want to do.

AR: What they actually said was that you seem to have the best system, (and this was last year), but they thought you were secretive. And I thought, well, gee, you wrote this whole book.

RM: Right, I'm not secretive. And I published three papers— and I'm working with a lot of companies. It's just I'm not working with them, and I think they always put their spin on stuff to try to promote what they're doing. I don't put much confidence in what they're doing as really real.

AR: Well, I mean if you published this whole book that explains everything, it's hardly secretive.

RM: It's not secretive. You made a good point. They do try to put their spin on things.

AR: When they have no answer, they say it's secretive?

RM: Right. There, if I'm disagreeing with them, and I'm saying I'm not making a nuclear reaction, (and who would even *want* a nuclear reaction—they act like a nuclear reaction is a great thing). And I say, no, it's not a nuclear reaction, and then, because I'm not going along with them, they say, "He's secretive." Like it is a nuclear reaction, but he's not telling you. I think that's what they're implying. And that's absolutely not true.

AR: Right. And tritium production is one of the most dangerous things on the planet.

RM: Dangerous. Gets incorporated in your DNA, for example.

AR: Right, and it's impossible to contain it forever.

RM: Right. It leaks out, permeates through metals. It's a very dangerous stuff; gets in your water supply, and then you're stuck.

AR: That's what I'm hearing, too. I like what you're doing, because it doesn't involve that.

RM: Yeah, they say: "Oh, we're producing harmless tritium. And *without* radiation, nuclear reactions, and, "We have no radiation, we have no nuclear products." Well, I tell them, that's like saying that Sun Oil Company is cold fusion. There's a reaction that makes heat with no nuclear products, right, so that's cold fusion. Heh, heh!

AR: Well, yes, anyway, I really appreciate your telling me all this, and I think that's really what I wanted to know.

RM: OK, well good luck with your story.

AR: OK

RM: Talk to you later, good bye.

END of Interview