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Buteyko Breathing - Bud Weiss, 2008-09-15

BW: Bud Weiss
RP: Ray Peat

(transcribed by Giraffe)

BW: Ray, could you just introduce yourself a bit, please?

RP: Okay. I had been a student of several other subjects such as linguistics when I began studying biology in 1968, and I had begun in brain biology at the University of Oregon because of my years of interest in psychology and linguistics, but as I ran into dogmatism, I decided to shift to biology of reproduction and aging because it happened that at the University of Oregon these people were less dogmatic than the ones in nerve biology. And some of the most interesting work at the university was being done in biochemistry, and so most of my course work was in biochemistry and endocrinology. And the biology of progesterone, estrogen and tissue respiration was the center of my pieces, and that led to interest in organismic respiration as controlled by thyroid and its interactions with progesterone and estrogen.

And by chance, before I begun studying at the university in 1968, I had visited Russia to talk to a biologist there who was studying the interactions of magnetic fields and the nervous system and the endocrine system. Because of my contact with Russian literature I ran into Buteyko's work right around that same time. I respected what he was doing because he was one of the few people in the world that really took the physiology of carbon dioxide seriously; as so many American biologists and physicians in particular think of it as a waste material rather than as a crucial biochemical.

In the early 1940th someone demonstrated that many organisms can live and reproduce even without oxygen, but they could find no cell or organism that could live and reproduce in the absence of carbon dioxide. So biologically it's in a way much more fundamental than oxygen. I didn't study much of Buteyko after that. I was just aware that he was one of the few people who had worked out the complex biochemical effects of carbon dioxide, but I would periodically check what the Russians were doing in relation to carbon dioxide physiology. There were a few others besides Buteyko, but it was really central to many of the things that I worked on, because progesterone and carbon dioxide for example both have an energizing and calming effect on all cells, everything from the brain to secretory and hormonal tissues.

My interest was not particularly in relation to asthma, but Buteyko noticed many other effects of carbon dioxide when he was working with people treating asthma as a focus. He noticed that some of the patients recovered from other degenerative terminal diseases. Those have been where I spent most of most of my effort thinking about the role of carbon dioxide in all of the inflammatory and degenerative diseases, and how it works synergistically with progesterone and protectively against the toxic effects of estrogen and other excitatory molecules.

And it turns out that all of the degenerative diseases are centered on an excess of inflammatory processes which de-energize the cells and shift the metabolism away from

the production of carbon dioxide and with a dominant tendency towards producing lactic acid in excess that can't be consumed and converted to carbon dioxide.

BW: That's a great introduction, Ray. As usual wonderfully complex. As I said to you before, there is some question about the Buteyko method and why it works. Could you speak a little bit about it in terms of your thoughts why reduced breathing would have the kind of profound effect that it is having?

RP: Okay. One of the effects of the thyroid hormone is to increase the consumption of oxygen, and that means to increase the production of carbon dioxide. And when the thyroid hormone is properly active it increases the ratio of progesterone to estrogen, and this shifts the balance in the body away from lactic acid towards carbon dioxide. If you define hyperventilation as a tendency to blow off the carbon dioxide, any time you produce too much lactic acid, it stimulates your respiratory center and makes you lose carbon dioxide, and lactic acid itself excites the inflammatory process in all of the tissues where carbon dioxide inhibits it. And so there are several things that will shift a person towards an excess ventilation or hyperventilation. And simply lower thyroid function, which makes you unable to produce enough carbon dioxide...

Your cells produce too much lactic acid in compensation, and that drives the respiratory system inappropriately and makes you lose the little bit of carbon dioxide that you are producing. So hypothyroidism is one of the basic things driving hyperventilation. There tends to be excess adrenaline in hypothyroidism compensating, keeping the organism running even though it might run at a low temperature. Sometimes hypothyroid people have 40 times more adrenaline production in a day than a normal person, and adrenaline is another thing that can shift you towards hyperventilation.

Endotoxin is always being absorbed from the intestine, and endotoxin stimulates hyperventilation and overproduction of lactic acid and the activation of inflammatory processes. One of the driving forces behind asthma is the tendency to have too much endotoxin being absorbed producing an inflammatory state of the respiratory system, and that can be detected as an exhalation of nitric oxide, a free radical that it is producing in the body. Patients with asthma exhale much more nitric oxide in their breath, and most of it is produced in the bronchial system, although inflammation anywhere in the body can raise the production of nitric oxide.

Carbon dioxide will antagonize that production of nitric oxide and lower the inflammation. So simply providing carbon dioxide works against some of the basic mechanisms involved in asthma. One of the interesting things about estrogen treatment of menopausal women is that it causes a shift toward alkalosis and increases the risk of asthma. And that's partly because it increases endotoxin absorption from the intestine and circulation in the blood stream, and partly because estrogen lowers the thyroid function. All of which tend to lower the production of carbon dioxide leading a relative hyperventilation and alkalosis, which helps to excite the inflammation and contraction in the bronchial system.

BW: Now by reducing the breathing, voluntarily working at reducing the breathing you... Does it make sense that you would at that point be raising CO2 levels?

RP: Yes, if you breath in a paper bag, it's the same thing as voluntarily holding your breath. Swimming under water will do the same thing. Anytime you hold your breath or breathe in a paper bag or force yourself to stay under water for as long as you can stand: That is raising the carbon dioxide and sort of acting as a sedative on your nervous

system, so you stop the excited adrenalin-driven over-ventilation, and you can gradually train yourself with a paper bag or swimming under water or just making the deliberate effort not to breathe so much.

I think it's good to do everything you can at the same time. For example living at a high altitude in Mexico city despite the pollution the incidence of asthma is drastically lower than it is in the lower altitude cities. That's undoubtedly because of the retention of carbon dioxide at high altitude where the oxygen pressure is lower.

BW: Aha, I see. Now one of the things that we have noticed, and as you say when you learned about Buteyko, he was treating an awful lot of more things than asthma ultimately. One of the things that seems to respond very, very rapidly is panic attacks, probably exactly for the mechanism that you are talking about. The exitotoxicity is really driven down by loading up with carbon dioxide. You even... If you have a number of small exercises that we do, that are rather simple, when someone has an attack at night to actually calm one selves down by using a series of shallow breathing exercises. All of which build up the CO2.

RP: Yes, and there is a drug called acetazolamide, the brand name is Diamox. It used to be considered a diuretic, but it became popular to prevent altitude sickness because it causes you to retain carbon dioxide. And hyperventilators are people who are susceptible to altitude sickness. So taking this acetazolamide makes you retain your carbon dioxide by inhibiting the carbonic anhydrase enzyme, and prevents altitude sickness, but it also prevents overbreathing and alkalosis at night. People who have sleep disordered breathing, it is found that acetazolamide will usually cure that. And it is very effective in treating asthma which is one of the pretty direct ways to show that carbon dioxide deficiency is so closely related to asthma and other breathing disorders. Epilepsy is another thing that can be prevented with acetazolamide or anything that raises your carbon dioxide. Neurologists used to demonstrate an epileptic brain wave just by having a person hyperventilate.

BW: Yes, we've been able to stop epileptic seizure. When someone knows that they have... Generally they know when their aura starts, and so if they practice reduced breathing when that comes up, they don't have seizures.

RP: Yeah, the old fashioned way to do that was just to give them a paper bag and make them breath in the paper bag for seizures or migraine or panic attacks or whatever.

BW: Now I remember you once telling me that at one point there was something called "firemen's oxygen" in which they had about 6 - 8 % carbon dioxide in the oxygen.

RP: Yeah, Yandell Henderson was the physiologist who got that popular to the point that fire departments all over the country started using it because the carbon dioxide at that very high concentration is extremely effective for restoring respiration to suffocated people, and for babies too that don't breathe properly.

BW: Is anyone still using carbon dioxide. Isn't it used or was used at some points in operation rooms?

RP: Oh, every now and then there is some person who says that hospitals are killing patients by giving them pure oxygen and say they would wish that hospitals switch, start using 5-8 % carbon dioxide whenever they give oxygen because it's basically stress

inducing and toxic to give people oxygen in excess. At sea level we really have an excess of oxygen.

Some biological examples I think to reinforce the importance of carbon dioxide: Rats normally live a maximum of two or three years, but an animal called the naked mole rat lives in sealed burrows underground. And they are about the same size as ordinary rats, but they live about 30 years. In their burrows they have an extremely high concentration of carbon dioxide and low concentration of oxygen. And bats who are famous for living in caves where the CO2 is high with a million bats in the same cave. And someone was pegging bats and trying to find out things about their life history, and no one really knows how long the average bat lives, but one dead bat was found that had been pegged 42 year previously. So compare a bat to a mouse of the same body weight, I think that illustrates how important CO2 is.

BW: Yes. Anything further... I know that you have many papers that are written in regard to CO2. In fact we have at least a couple, maybe more than two of your papers are up on the international site, on Peter Kolb site. You were very generous to allow us to put those up.

Any kind of closing remarks? I know we could go on, you could go on for hours about this. But any particular closing remarks you'd like to say in regard to CO2 and its function in so many different ways in illness?

RP: Well, you have to be cautious around doctors because doctors still tend to think of carbon dioxide as a waste material and they tend to shut their ears if you mention the beneficial effects of carbon dioxide.

BW: It's amazing when you think that it is in the primary physiology textbooks. That "Bohr effect" is... you know, is primary physiology.

RP: Yeah and there is much more basic physiology that is even more interesting than that. For example, they talk us of the eye, the sickness of the cornea, the transparency of the cornea and the lens and so on. Carbon dioxide is essential for practically all biological processes and it's widely ignored even though the basic science is there.

BW: Well, I want to thank you so much for being available for this brief interview, and I am going to be putting out to everybody that they definitely should be visiting your website and to get your journals and to look into the previous journals that you have written in regard to carbon dioxide and of course if there is anything else that they are interested in. There is a wide range of things that you have had available to people. So thank you so much, Ray. I appreciate your friendship and your collegial assistance and support for the years. Thank you so much. Bye now.

RP: Bye.