

# CardioRetinometry® Solves the Riddle of the Retinal Arteriolar Reflex: A Review of Experience with a Contact Lens Wearing Population, with Life Extending Possibilities

## Abstract

In 1999, 18 months after installing the first UK electronic fundus camera, changes in the central artery and vein of the retina (CA&VOR) were noted, corresponding in such circumstances, with predicted atheromatous pathology hypothesised by Nobellist Dr Linus Pauling PhD, and cardiologist Dr Matthias Rath MD. Intended for sequential retinal photography to reveal microscopic "nasal shift" (NS) of the CA&VOR, NS is pathognomonic of primary open angle glaucoma before characteristic visual field losses risk permanent damage to sight. Benefitting from the frequent opportunities for checking, provided by aftercare required by captive contact lens wearers, informal epidemiological study of this contact lens wearing population of over 2,000 people produced over 400 sets of complete images ranging over periods from 1998 mostly of 2 to 12 years. Throughout this time, the entire patient base of contact lens wearers was available as part of their aftercare at intervals of 3 to 6 months. Because of the risk of opportunistic eye infections every patient was questioned at every examination by qualified nurses, regarding inclusion of antioxidant to optimise the immune system and reduce risk of allergic conjunctivitis and infection. A pattern emerged of non-compliant patients' fundii showing slow, expected deterioration of circulation, discomfort with soft contact lenses, and a higher annual "drop-out" rate. The

customary annual "drop-out" rate of 30% of non-supplement supplying practices was never achieved. Instead, a stable population with continuing general reduction of arteriolar reflex was noted. Further research is needed to establish whether or not contact lens wearing in such circumstances can lead to life extension as claimed by enthusiastic medical contact lens wearing patients. Because Michelson, Morganroth, Nichols and MacVaugh assured close retinal correspondence with coronary heart disease, author Bush was illegally struck off, for claiming incipient coronary disease cure below the corresponding, medically ignored <49% "normal" atheroma.

**Background:** In 1953, the author qualified as diplomate of the Institute Of Optical Science under the stewardship of Dr WJ Porter PhD, DO pt, MPS, and Mr Reginald Goode FBOA, DO pt. In London, there being no degree qualification at the time. This later merged with the British Optical Association whose members after having qualified also by similar examinations in ophthalmic optics, pathology and practical optics, registered with the newly formed General Optical Council and assisted in establishing the first City University course and examination. The College followed the creation of the Degree in Optometry, with Fellowships of the new College of Optometrists. Bush completed the 1st MB at Hull University, passed Newcastle University Human Anatomy with high marks for 2nd. MBBS, and the Royal Colleges LRCP, MRCS (2nd) in Human Physiology, before, overqualified, switching to Optometry and gaining the top prize for the year with which he purchased a Dr Schiötz tonometer, but, unknown to him, having trained with Mr John Magnus FRCS Chief of Ophthalmology for a year, at York County Hospital, he was unaware that no other Optometrist at the time was trained in its use. This led to an obsession to be the first to discover the true nature of and perhaps the prevention of glaucoma. This led to the discovery of CardioRetinometry®.

## Introduction

Contact lens practice, with the first video slit lamp microscope, and new found ability of the Sony picture in picture full colour

image processor printing to hard paper, video recording, and video playback of captured circumcorneal vessels in the late 1980s was an exciting time. All patients were quickly found to gain benefit from antioxidant supplementation, leading to white

## Review Article

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### Sydney J Bush\*

Head of Faculty of Optometry & CardioRetinometry,  
Cosmopolitan University, Director Institute of  
CardioRetinometry, UK

**\*Corresponding author:** Sydney J Bush, Skidby House, Head of Faculty of Optometry & CardioRetinometry, Cosmopolitan University, Director Institute of CardioRetinometry, Skidby, England HU16 5TF, UK, Tel: 00441482841842; Email: SydneyBush@Hotmail.com

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eyes, less discomfort and apparently fewer infections. Much was learned of the effects of antioxidant nutrition on the circumcorneal vasculature before the advent of the electronic fundus camera enabled closer study of the retinal microvasculature. The help of the Nebraska University's Father of free Radical Theory of Ageing and Disease (Nov 1954) Professor Denham Harman [1] was enlisted and he spent a week in Hull with author Bush also lecturing a joint meeting of Optometrists with the British Medical Association.

This opened a new dimension for retinal study searching for NS of the CA&VOR with a succession of retinal cameras before the introduction in 1998 of the first electronic fundus camera by Topcon enabling the instant demonstration at ultrahigh magnification of microscopic displacements of the CA&VOR, the smallest variations of position to becoming detectable. The first electronic corneal endothelial microscope to enter the UK was also acquired for parallel endothelial studies. Current teaching and many medical websites are wrong: The retinal arteriolar reflex is here shown to be intraluminal atheroma impeding circulation. The arteriolar reflex has always been taught as an "ensheathment" of the arteries, "a healthy sign," or, as some say, a thickening of the arterioles. The latter is seen to be immediately untenable for it completely fails to explain why the reflex can be equally visible in the venules and is seldom an intraluminal atheroma forming a blockage.

This is very worrying and incredible that it has been allowed to carry on. Could it be because, here is visible confirmation of rejected Pauling-Rath theory? The Modeno Atlas and modern books on Ophthalmology provide similar retinal depictions of streaked arterioles and venules stating that they represent the "normal healthy fundus." Author Bush states that it is because the classification is so very wrong that cardiologists laughingly assure their patients after X-Ray coronary angiography that they are "Grade Zero," but it "does not mean that they cannot drop dead as they leave the hospital!" With up to 49% blockage of all three epicardial coronary arteries this is difficult to accept as satisfactory and people like Mike Reid taking the part of Frank Butcher in the TV "East Enders" did exactly that within a few days of leaving hospital after his X-Ray coronary angiography resulted in his being given the "all clear." Certainly, we can expect that his retinal vessels on funduscopy would have been no different from the average. That must surely explain why over 60% die of coronary thrombosis or other cardiovascular disease. Is it not far more likely that if cardiologists were honest, they would admit that it is unusual to find anybody at all with no coronary atheroma, and that there is no justification whatever for either coronary x-Ray angiography or surgery for deficiency disease. But this digresses.

### Hollenhorst Plaque

The riddle of the retinal arteriolar reflex starts with Dr Robert W Hollenhorst [2] who contributes most to our early, fundamental knowledge yet, apart from his name attaching to the often, but not always "Y" shaped plaque, noted at arterial and some venular bifurcations, his work has been largely ignored. This is very mysterious. Contemporaries were more active in the area of this research than today where we find no willingness to recognise or

even discuss the arteriolar reflex except in terms of atheromatous reflex of varying width proportionate to the diameter of the vessel and significance for hypertension – nothing else. Indeed, the paper that was most exciting, revealed that in 1979 cardiologists Michelson [3], Morganroth, Nichols (Ophthalmologist) and MacVaugh graded the coronary atheroma score as follows- simply regarding the white streak on vessels as a reflex.

G0 = Normal up to <50% stenosis of all vessels.

G1/2 =  $\geq$  50% but <70% stenosis of one vessel (other than Left main coronary artery).

G1 =  $\geq$  70% stenosis of one vessel or  $\geq$  50% occlusion of left main coronary artery.

And the Light Reflex Changes

Grade 0 = Normal thin walled arterioles

Grade I = Minimally increased light reflex

Grade II = Increased approaching whole width of arteriolar wall

Grade III = Colour change, copper wiring

Grade IV = Obliteration of vessel wall, silver wiring

They commented that "the data suggest that in selected patients abnormal funduscopy findings reflect the presence and extent of coronary artery disease-even minimal light reflex changes were found to be very sensitive although not specific indicators of coronary artery disease." "An abnormal light reflex identified 46 of 47 patients with coronary artery disease (98% sensitivity)->GII, 100% specificity was specific and, in addition predicted ore underlying coronary artery disease." The abstract to their papers states-"Retinal arteriolar changes were graded with respect to light reflex, vessel calibre, arteriovenous crossing defects and vessel tortuosity -"and continues" Each coronary vessel was graded with respect to its most occlusive lesion by angiography - etc". Here we see the discrimination between the "reflex" in the retina arterioles, and the "most occlusive lesion" in the coronary vessels. Why? This paper is not intended to more than touch on the importance of the retinal arteriolar reflex and it is therefore beyond its remit to go further into the importance discovered by the three cardiologists relating to coronary artery disease diagnosis and calibration through the simple expedient of retinal artery evaluation. Obviously, if a convenient mistake has been made, that thwarts the best practice of Optometrists to alert to dangerous levels of coronary arterial heart disease, by falsifying their education, massive socioeconomic effects could result.

This could have genocidal implications rendering useless, an entire profession dedicated and highly trained in the observation and recording of retinal defects. In July 2016. An Optometrist was found guilty of "Manslaughter" after failing to diagnose a brain tumour in a young person. Author Bush considers himself fortunate never to have found himself alleged to have missed a dangerous disease in his 57 years of practice. But with over 50% of the Optometrists' patients throughout the UK and further afield dying prematurely of deficiency related coronary heart disease, which is guilty of manslaughter on an epic scale? It cannot be the Optometrists. It can only be those who are keeping the truth to themselves. My sympathies lie with my fellow Optometrist,

Honey Rose, who would not deliberately risk this. It is very rare in children to find brain tumours with retinal involvement. I am sure that she is an excellent and caring Optometrist who has been misled by the fraudulently poor training she has received, and in due course a review of these injustices will be called for. Has the training of Optometrists been sabotaged?

The work of Hollenhorst and his review suggests it has. Has the public been exposed to a “cover-up” set in place to preferentially offer the crude and dangerous X-Ray coronary angiography and then a house remortgaging heart bypass procedure? The temptation versus the loss of (USA) \$200,000 procedures may have changed perceptions re the relative value to cardiologists of the surgery for a deficiency disease. If so, the entire fraud, if there has been one, depends entirely on no Optometrist being allowed to discover the truth. So what do we find when we look at the history of the discovery of CardioRetinometry®? Exactly that: Violent opposition: Illegal decisions: Malfeasance by health authorities: Perjured evidence sent to the General Optical Council. (GOC): Threats to deny future contracts: Threats to strike off the register: Computer attacks; and two forced relocations by the practice landlords without good reason. The BBC ban on author Bush after explaining his suspicions to the public, and the true history of New Zealand Farmer Allan Smith, and finally what author Bush claims was his absurd restoration to the register two years after retirement at age 80, for the purpose of enabling his illegal striking off the register solely as a warning to other optometrists (?) to disregard his teaching on the retinal arteriolar reflex? This in the face of repeated newspaper reports by celebrated medical journalist and worldwide syndicated columnist, Dr Kenneth Walker MD (Harvard) who compelled by the Canadian Medical Association to write under a pen name, is writing as Dr W Gifford-Jones MD. And repeatedly claims that “Dr Bush’s Historic Discovery is Worthy of the Nobel Prize.”

However, the GOC, in its wisdom, discounted this, 200 written testimonials, and its life saving potential for practising beyond his qualification despite Medical and nutritional authorities supporting him. This is all highly relevant to a cover up? Frustrating the research of the retinal arteriolar reflex, the literature shows few abstracts available for papers before 1975, and the research becomes extremely time consuming and tedious. But with the help of Google, progress was made. Puzzled by this, author Bush performed a small and probably, by the standards of critics, inappropriate experiment. In this a plastic tube was pushed into butter to represent plaque. Immersion in water then showed that strong reflection from the tube itself (representing the arteriolar wall) largely disappeared under water. Author Bush would expect to find this in exactly the same way in the eye.

In addition to this, his studies of the circumcorneal vessels showed little reflex from either the vessels or the overlying conjunctiva. These tissues are not at all reflective any more than meat on a slab until it is made wet. Would we expect an artery that hardly reflects at all in air, to reflect when surrounded by a gel? The reason why circumcorneal vessels do not show a reflex. There is a simple explanation. As far as author Bush can determine, it is not to be found in the literature. The hypothesis that the retinal arteriolar reflex proposed here originates from the accepted

transparency of the healthy arterial wall permitting direct view of lipid based intraluminal atheroma, depends on one factor that does not apply to circumcorneal vasculature; the Intraocular Pressure (IOP). It is the extra blood pressure required to push the blood into the closed cavity of the skull and then outwards and onwards through the foramen and optic nerve into the highly pressurised eye’s IOP at around 15mms Hg, that imposes extra and unique stresses on the retinal arteriolar endothelium. There is no IOP effect on the external vessels.

It is this that gives the retinal arterioles the conditions to require frequent reinforcement according to author Bush’s preferred theory of lipoprotein alpha being a surrogate for vitamin C, where the immediate formation of collagen to maintain the waterproof barrier of the vascular endothelium is not possible. The last paper to advance a reasoned explanation for the arteriolar reflex was published by Brinchmann-Hansen and Heier [4] in claiming that the reflex was from a “rough reflecting surface” or from the “*blood column.*” Clearly the benefit of the Hollenhorst paper was not available to them. Nor did they sufficiently study Snell’s law of reflection. The last suggestion appeared to contradict the observations ranging from no reflex – from wide open (supposedly the most healthy arteries) to the other extreme. That is when no blood is visible at all at the thin “silver wire” stage. That is when the vessels are very blocked with atheromatous plaque. However, author Bush states it is not absolutely indicative of total absence of blood as fine channels can still exist through it. It is however, invariably associated with adjacent areas of retinal ischemia. Strong on selected angles of reflection, their paper completely ignored the variability of the “reflex” for which it can offer no explanation. It is fair comment, that RW Hollenhorst was much closer to explaining the reflex.

Doubtless author Bush will learn more. Suffice it to say that CardioRetinometry® studies with ascorbate show even silver wire to be completely reversible. This confirms without x-rays that coronary artery disease is equally reversible. A simple experiment (Figure 1,2). The sparsity of reports on this subject is surprising in itself and even more so when Hollenhorst himself, writing in his 1961 paper before this author’s interest, says the same thing in Transactions of the American Ophthalmological Society, the highest impact journal of the day in that speciality, He had to say “*It is difficult to understand why so few reports have appeared on the occurrence of these phenomena in the retinal arterioles. They undoubtedly have been observed clinically, more frequently than the literature would indicate. One limiting factor is the absence of pathological verification.*” He then comments that Fisher (1959) [5] and Duke-Elder [6] cited reference to “*more than 200 cases of retinal arterial occlusion.*” Minton [7] recorded “*54 cases of occlusion,*” and Butler [8] reported “*a bright embolus that disappeared after three weeks. Only a few of these articles contained descriptions that appear to be similar to the findings in my cases. (SJB’s emphasis) Neither Fisher nor Duke-Elder mentioned these bright plaques. Gowers [9] in 1975 reported that he saw minute granular masses in the central artery of a patient who had occlusion of the central artery of the Left eye and Right hemiplegia caused by thrombosis of the Left internal carotid and middle cerebral arteries.*” He then continues describing various workers reporting emboli in the retinal vessels.

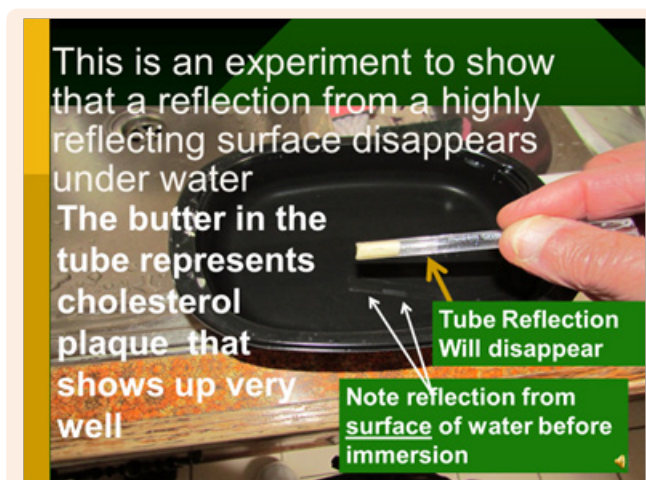


Figure 1: Reflection from a highly reflection surface disappears under water.

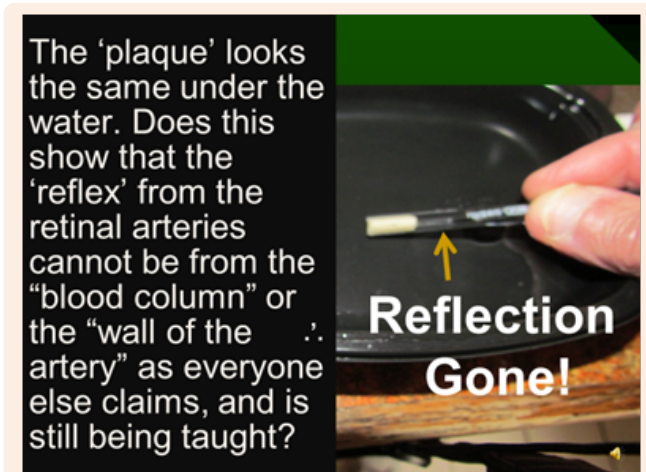


Figure 2: Reflex from the retinal arteries cannot be from the blood column.

Amongst these he credits Panum [10] in 1862 with being the first to report embolization of material and Hollenhorst states that the coronary artery was eventually occluded causing death. Gowers (1875) restricted to candle light and indirect ophthalmoscopy is credited with recording the first "minute granular masses in the central artery of the retina with corresponding blindness). Minton [7] reported a clinical study of 54 cases of central arterial occlusion without mentioning bright features. Michel [11] found a bright yellow thrombus in the central artery at autopsy. Elschniig [12] had a patient with atheromatous occlusion of the internal carotids, ophthalmic artery and central artery of the retina. Fisher reported a few cases and Duke-Elder also but their mention of bright particles was very limited compelling Hollenhorst to comment. He went further. Hollenhorst then makes the profound statement that he "has often seen these plaques break up and move, dispelling any notion that they can be sourced to the adventitia." This clinical observation supports author Bush's view that Linus

Pauling [13] was 100% right when he proposed with Rath [14] that the antioxidant was playing a major part in the endothelium.

Clearly then, Hollenhorst himself, before the matter was debated by the authorities at the time in the discussion ending his paper, also had to agree, that the motility of the bright plaques precluded their being in any way associated with the adventitia of the arterial wall, and they certainly could therefore never be attributed to any kind of "ensheathment," that as its name suggests, is static. This is all well confirmed in thousands of CardioRetinometry® time lapse retinal photographs. Briefly, Pauling and Rath state that the atheroma in all the vessels wherever it occurs, has to be the result of a "metabolic countermeasure" deriving from a surrogate application of Lipoprotein alpha, found only in Man, and purposed in the blood to provide cover for conditions of malnutrition when collagen cannot be assembled due to lack of one or more of its constituent components. This is a "back-up" for the second defence in Man, a "genetic countermeasure" seen as thicker walled arteries than in vitamin C producing animals. It is not the purpose of this paper to go further than to record the events, cite the evidence, connect it to the known hypotheses, and ask the question: Could the hypothesis of Pauling and Rath, supported by Michelson, Morganroth, Nichols, and MacVaugh augmented now by direct observation of presumably beneficial changes in the retinal vasculature satisfy the following criteria to support their hypothesis? To do so (and author Bush believes it proved now by CardioRetinometry®) their hypothesis

must meet and overcome challenges from the now visible –

- i. Reductions of retinal arteriolar and venular "reflex," accompanied by
- ii. Widening of vessels,
- iii. Greater blood flow,
- iv. Visibly improved perfusion of the retina,
- v. Reduced pallor of the optic nerve,
- vi. Reductions of optic atrophy shown by
- vii. Apparent recovery of disc shape, reduction of retinal ischemia,
- viii. Reduced arteriolar and venular tortuosity and
- ix. Reductions of giant cell conjunctivitis and conjunctival hyperaemia in this population of contact lens wearers, all pointing to a new approach being needed to the teaching of Optometry, Ophthalmology, ophthalmological disease and its management?

The subject of CardioRetinometry® is now expected to be the source of hundreds and possibly thousands of papers as practitioners explore the possibilities it offers for evaluation in real time of the effects of all kinds of nutrients and substances on the corpus humanus. Statins, antioxidants, medications and nutrients of all kinds need to be researched. One of these papers is expected to address the gap as shown in the listed citations between 1959 and 1995. Apart from Duke-Elder, little was

reported of value except Flory [15] mentioned arterial occlusions produced by emboli. Between 1961 and 1989, it is as if the world was mostly forgetting about pathology in the retinal veins and their potential for relevance to systemic disease. We cannot go back in time, but work that we should expect to have been done and should have been done does not figure in the archive.

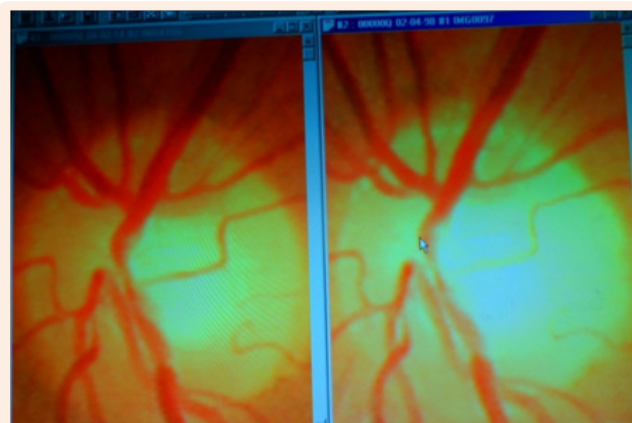
In fact it has already been addressed and the “beading\*” that is hypothesised in the paper by Gregson et al. [16] in 1995, will be examined in a completely different light, with different methods and it will be seen that the beading can be made to disappear in a few months. That will probably be the first of many papers to follow on the subject, but the purpose of this paper is simply to give notice of some of the things that have been discovered, nothing more. As a clue to what is to come, the retinal photographs below are offered for study. When new techniques are announced, a flurry of interest and “me too” papers tend to appear. A similar event occurred with the introduction of fluorescein retinal angiography. Some, thinking about fluorescein angiography may therefore say that this is not new. Fluorescein angiography is an invasive procedure with severe limitations. With CardioRetinometry® there are no limitations. One can take photographs until the subject falls asleep.

### X-Ray coronary Angiography

With X-Ray coronary angiography not only is the procedure itself complicated, inaccurate and unrepeatable because of the radiation burden, but there is an incidence of 2% of new cancers that cardiologists rarely mention. There would seem to be little justification for X-Rays for what is a suspected metabolic deficiency and now, even less for surgery for an antioxidant deficiency. In the “normal” course of events over a period of 16 years, from 1998 to 2014 as shown above, the expected change would be from Left to Right as atherosclerosis develops, circulation deteriorates and death slowly approaches. Here we see the deterioration not only arrested but reversed. All the vessels are functioning better, neural recovery is evident. Blood flow is greatly improved and if the peripheral vasculature were shown it would be seen to be better perfused with reduced tortuosity of the vessels. The images are of the retinae belonging to author Bush’s older son born in 1956. His fundi now resemble more what we might expect to see in a very healthy 20 year old, and definitely better than we would expect to find in a sportsman engaged in competitive events with corresponding stress (Figure 3).

As stated, it is not the purpose of this work to deal with coronary artery disease. After Michelson et al., in 1979, it was almost as if a signal was sent to other researchers that future work in this area might be counterproductive. Thus it rested, until the Croatians Ugrica D et al. [17] possibly appeared to fear no consequences. Nothing could be found of significance published after that in PubMed in a search for “Retina AND atherosclerosis.” When Dr Russell Watkins [18] alerted author Bush to research by Wong TY et al [19] in 2004 and replying on July 23<sup>rd</sup> 2004, an invited Rapid response” was published by author Bush. After that, the provocation by author Bush, publishing retinal photographs of reductions of retinal arteriolar reflex on the Internet in 2002 set more researchers looking. Even though Wong ignored the rapid

responses he received, others were stimulated. By coincidence, Chapman et al. [20] published, and then a small flood, Fernandez et al. [21], Tedeschi-einer [22], Tabatabaee et al. [23], Pikuleva et al. [24], De Boever et al. [25] and doubtless many more are ‘in the pipeline.’



**Figure 3:** X-Ray coronary Angiography.

### Conclusion

The regular and frequent evaluation and comparison of time lapse retinal photographs at ultrahigh magnification provides a tool for the measurement of scurvy that has never been recognised and is now available. The first medically qualified doctor to take the course with high aptitude is expected to graduate and immediately start offering life extension in May 2017. It is expected that he will have charge of the lives of senior government and key people in society on whom we depend for stability of the West.

Until more physicians study what has been shown to be a one year course for those of high aptitude, and a two year course for less able physicians, it is clearly useless to consult any doctor in the West who cannot avoid the same fate as his patients, and will die of the same coronary heart disease or other avoidable cardiovascular disease. The monitored nutritional protocol of CardioRetinometry makes it possible to almost certainly eliminate 98% of thrombosis and fatal coronary heart attack risk. This is well supported by the work of Double Nobellist Dr Linus Pauling and cardiologist Dr Matthias Rath amongst many others. 50% life extension is becoming a reality. Ten years ago author Bush published “Pension Funds to Crash.” It is happening. Eventually, everybody who wants the best chance of avoiding at least 50 scurvy related Diseases to 110+ will want to be registered with Doctors of CardioRetinometry (DCardioRet). The Biblically prophesied 120 year lifespan in Genesis 6:3 may well be achieved from a sufficiently early start, with 6 monthly checks to adjust nutrition as needs vary with age. The Cosmopolitan University enjoys the distinction of being the first to have a Faculty of Optometry and CardioRetinometry. Because it is not accredited, it is free of State control that has overseen restriction of medical education exposed in this and other papers by Author Bush, who derives little pleasure from his discoveries regarding medical corruption, misleading papers, the corruption of the PubMed

archive, the 'Black Hole' of missing vitamin C research and the true nature of disease origins.

### Conflicts of Interest

There is presently no commercial interest on the part of Dr Bush except in providing post-graduate training and the new degree of Doctor of CardioRetinometry® (DCardioRet) to primary health care professionals eg Physicians and Optometrists, whose education in medical schools did not exhaustively include Life Extension, life shortening Scurvy in its many focal occult forms, nutrition, the vastly extensive subject of ascorbate biochemistry, ophthalmology, physiology, pathology and the Sanarelli-Schwartzman, generalised non-specific uniform mesenchymal reaction, all relative to cellular health and prevention and to form the basis of many future papers. Toximolecular Medicines-an appreciation. Author Bush wishes it to be understood that he appreciates that he would not be writing this paper without having received the benefit of many honest doctors and surgeons, in his approaching 90 years. In the last decade, as a result of unwise personal excesses, he has benefitted from effective "Toximolecular" medications even though "orthomolecular" remedies are preferred, but not always as effective. Toximolecular treatments helped when he unwisely "blew" his mitral valve. Today he benefits from an honest doctor, "Toximolecular" effective diuretics, and must give full credit where due to Bisoprolol, Losartan Potassium, and for him – Bumetanide-with his great nutraceutical support - a super diuretic.

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