

Planetary Association for Clean Energy News

Malillumination and Biological Systems: A Challenge for Designers

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Until recently, the main concern regarding interior artificial lighting was a sufficient lumen level to see clearly, straining the eyes plus its esthetic value and decorations. Little consideration has been given in the past to possible biological effects on human health and behavior.

However, more and more articles are constantly appearing in recognized scientific journals,¹⁻⁴ indicating that lacking any part of the full spectrum wavelengths of natural outdoor daylight, a condition now referred to as malillumination, has been shown to affect human behavior in a way similar to malnutrition. The results primarily from what is lacking in the diet.

Wavelength absorption by human body

It is now apparent that there is a direct relationship between the wavelength absorption of every mineral, chemical or nutrient taken into the human body with its characteristic wavelength of light energy. Such interactions are with wavelengths beyond the visible light and take in the entire electromagnetic spectrum.⁵

This raises many very serious and reaching questions as to what extent interior designers, may be more responsible with regard to specifications to interior lighting from artificial sources.

Reviewing the nature of metabolism

The living cell and the fundamental process involves so many overlapping functions that perhaps it is now time to stand back and get a good overall look at the whole picture.

To do this it might be helpful to use certain terms or phrases to bring certain concepts closer understanding within a great many disciplines.

For example, metabolism might be compared to biological combustion. When we think of combustion we think right away of this sort of combustible material, that is in other words—nutrition.

Oxygen is definitely a requisite for the adjustment of the carburetor in your engine is done with a very delicate adjustment. Some automobiles now sold in high altitudes where the air is a little thinner use more delicate methods to adjust the amount of oxygen. When extra oxygen is given to premature babies in their incubators, blindness, deafness and brain tissue

Light: The ignition system for metabolism

We take for granted that a combustion engine also needs an ignition system and that if the spark plugs are dirty it is a waste of time to work all day adjusting the carburetor or putting different additives in the gasoline. But we are totally ignoring the biological combustion, or metabolic ignition system—that is, the interaction of light or electromagnetic energy.⁶

Light is generally thought of as something other than electrical energy such as radio waves, but it is just as much a part of the total electromagnetic spectrum and, therefore, actually does come within the technical classification of being electric energy.

As previously mentioned, every chemical, mineral, vitamin or substance of any kind that we take into our bodies has a maximum wavelength absorption characteristic of electromagnetic energy. We also know that this wavelength energy penetrates the skin and directly interacts with the chemicals and minerals in the blood supply. Blue light, at wavelengths of approximately 4000 angstroms is used to interact with and break down the bilirubin serum in the blood of premature babies with jaundice so that the liver and kidneys can excrete it. Without exposure to this particular wavelength, the bilirubin serum builds up to a toxic level that ultimately causes brain damage and possible death.

Interaction between toxic build-ups and exposure to light spectra

In a similar way, the build-up of toxic levels in the blood of factory workers from exposure to industrial chemicals could be influenced by the type of artificial lights used in the working area.⁷

The European Society for the Study of Drug Toxicity has reported that the lethal dose rate is lower for drugs when administered during the nighttime than during the daytime.

Those minerals and chemicals in the individual cells of our bodies that would normally be metabolized by the wavelengths that are missing remain in the equivalent of darkness, even though other wavelengths are present. The end result would be an incomplete metabolic or biological combustion process.

Light and endocrine processes

We also know that light received through the eyes in addition to vision stimulates the pineal and pituitary glands.⁸ These master glands control the endocrine system that regulates the production and release of hormones that control body chemistry. This would then seem to me to be a carry-over of the basic principles of photosynthesis in plants, which is sometimes referred to as a conversion of light energy into chemical energy, to animal life which has not heretofore been recognized. Thus it is the wavelengths that are missing in various types of artificial light or that are filtered from the spectrum of natural light by window glass, windshields, eyeglasses and particularly tinted contact lenses or other devices of eyeglasses, smog and even

suntan lotions, that are not only responsible for the condition of malillumination, but also are failing to activate certain endocrine functions.

Many doctors are referring to cancer as a disease of endocrine imbalance and treating the master endocrine gland, the pituitary, with drugs or performing surgery without realizing the important role that light plays in controlling this gland that acts as the balance wheel of the endocrine system.¹⁰

Cancer is often described as being an uncontrolled growth that has gone wild. Such a condition would certainly seem to be directly related to a mixed up metabolic or biological combustion process.

Fluorescent, mercury vapor, sodium vapor, multi-vapor lights: culprits of allergic response

All fluorescent lights contain mercury vapor lines that are customarily shown on wavelength charts as only one one-hundredth of their true intensity and one hundred times their true width, in order to represent the same relative energy and get them on an ordinary size sheet of paper. This gives a grossly distorted impression of the intensity of these wavelengths being one hundred times less intense than they actually are and also showing a high peak of energy including a band of wavelengths one hundred times broader than actually exists. Other types of gaseous discharge lights, including mercury vapor, sodium vapor, multi-vapor, etc., also contain similar very narrow lines or wavelength peaks.

If the wavelength absorption characteristics of a food or drug happen to coincide with such an extreme peak of energy in an artificial light source, then the result could be an over-reaction or an allergic type of response.

Another major problem with all fluorescent lights as well as all the other types of gaseous discharge tubes or bulbs is that they emit RF radiation beyond the range of visible wavelengths. These are known to cause computers and scanning equipment used in hospitals to give erroneous or erratic readout results and, accordingly, plastic diffusers with a grounded wire grid are recommended for the fluorescent light fixtures. This RF radiation has now been found to cause muscle weakness and other physiological and psychological problems.¹¹

Loss of muscle strength from radiations, synthetic clothing, bleached sugars and flour

Loss of muscle strength can easily be demonstrated by using the relatively new technique of kinesiology. Have a person stand under ordinary fluorescent light fixtures with arm held straight forward and palm facing downward. Press downward on the wrist while the person resists, in order to establish the strength of the shoulder muscle. This should be done first with the fluorescent lights turned off and then repeated with the lights turned on. Usually there will be a very noticeable difference in the muscle strength. However, this test does not always work, as there are other factors that grossly affect muscle strength that must be eliminated. *These include no. only*

such items as ordinary eyeglasses and especially tinted contact lenses and deeper colored sunglasses, including the type that turn darker outdoors, but also radiation type smoke detectors within a distance of fifty feet on floors above or below test area location. Any wrist watch or nearby clock with a luminous dial or battery-operated mechanism, calculators, video display terminals, certain types of synthetic clothing, especially vinyl imitation leather and polyester, and what the patient may have eaten during the previous three or four hours such as refined sugar or white bleached flour will also weaken muscle strength. The wavelength characteristics of light reflected from different colored walls is similar to that passing through filters of similar colors and must also be considered. For some unknown and unexplainable reason, pink and orange produce the greatest loss of strength and blue the least when compared to full spectrum outdoor natural daylight. The recent rapid swing toward the new, more efficient but at the same time grossly distorted pink and orange spectrum range of the new type sodium vapor lighting only raises further very serious problems concerning its effect on human health and behavior.

Synergistic effects or counteractions

Certain single items that weaken muscle strength will complement each other when combined and produce a synergistic effect while other combinations may counteract each other and produce no effect.

Of a similar note, hospitals that have installed electronic fetal monitoring equipment in their maternity wards are experiencing an alarming increase in the rate of Caesarian section births,¹² due to loss of uterine muscle strength of the mother. Radiation type smoke detectors, digital wrist watches and polyester sheets and night clothing are especially high on the list that diminish the sex drive and/or cause impotency.

All these recent findings are helping to make it possible to better understand the results of previously reported studies¹³⁻¹⁴ of the effect of different colors or wavelengths of light on laboratory animals that could not be fully explained and were therefore ignored.

These studies indicated that the most significant abnormal conditions found in laboratory animals resulted from exposure to pink fluorescent light. They included excessive calcium deposits in the heart tissue, smaller number and lower survival rate of young in the litters, significantly greater tumor development or cancer, which has now been confirmed by six major medical centers, plus a strong tendency toward irritable, aggressive (constant fighting with one another), and cannibalistic behavioral patterns.

Learning behaviour and lighting fixtures

A study conducted in a windowless elementary classroom showed dramatic reactions in children to an improved lighting environment.¹⁵

Under their normal classroom lighting, some first

graders in the study demonstrated nervous fatigue, irritability, lapses of attention and hyperactive behavior. After installing full spectrum lighting with lead foil shields over the cathode ends of the fluorescent tubes to stop suspected soft x-rays and an aluminum screen and grid over the entire fixture to stop known RF radiation, which is characteristic of all fluorescent tubes, a marked improvement appeared in the youngsters.

Without any use of drugs, the first graders settled down and paid more attention to their teachers. Nervousness diminished and teachers reported that overall classroom performance improved. The children were unaware of the special cameras mounted near the ceiling that snapped sequences of time-lapse pictures during the class day. With the standard type of unshielded lights still in operation, students could be observed fidgeting to an extreme degree, leaping from their seats, flailing their arms and paying little attention to their teachers. After the full spectrum shielded lighting was installed, the same children were filmed two and three months later. Behavior was entirely different. Youngsters appeared calmer and far more interested in their work. One little boy, who stood out in the first films because of his constant motion and who was inattentive to everything, had changed to a quieter child; able to sit still and concentrate on routine. According to his teacher, he was capable of doing independent study and had even learned to read during the short period of time.

There is a lot to be learned about how light and radiation affects not only human muscle strength but also its effect on general health and behavior, including work production and efficiency. But the fact that it does is now indisputable. Perhaps the expression "the last spark of life" should be taken more literally, for it appears to be this electrical dimension that makes the difference between a living cell and a dead one.

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Transmutation of the Elements in Oats: New Analyses

By the end of the summer, 1979, it seemed appropriate to undertake new analyses on the quantitative variation of Elements occurring during the germination process in the Oats species. Such oats (Blond Hybrid, Pénarth Variety) would be subjected to a culture for about four weeks in very pure water (pH 5.7, \pm 0.1 acidity), and protected from any possible external input of minerals—via the ambient air, for example.

This new research involved modifications when compared with those conducted over the previous twenty years. It would account for hard to measure activities and variations of two principal anions: Phosphorous and Sulphur. All the previous analyses were limited to the quantitative variations of the cations because of technical limitations connected with the Physical analysis and the Chemical analysis instruments.

The *Microanalysis Laboratory of the CNRS (the French National Scientific Research Center)* had just received a mass spectrometer that is linked to a computer. The instrument enjoys improvements in both sensitivity and specificity; so, the quantitative dosages to both Phosphorus and Sulphur became accessible to meaningful readings.

Previously, chemical analyses were made through acids of the ashes of the oats. This meant that the Phosphorus and Sulphur (in their organic form) would become volatile at temperatures.