

An Alternative View of the Red-Shift.

Jeremy Dunning-Davies,
Department of Mathematics and Physics (retd.),
Hull University, England
and
Institute for Basic Research, Palm Harbor, Florida, USA.

j.dunning-davies@hull.ac.uk

Abstract.

Following discussions between people working in totally different fields and from totally different scientific backgrounds, an alternative explanation for the well-known red-shift in cosmology and astrophysics is offered. This alternative is very much in line with the way sound is attenuated in various media and owes everything to that piece of knowledge.

Introduction.

In whatever field someone works, that person will be conditioned in all his thoughts by the knowledge he has accumulated over the years and will remain influenced by the actions, attitudes and beliefs of all who surround him. It follows that so-called ‘conventional wisdom’ will undoubtedly play a part in most thinking. This is probably inevitable but it is easy to see that it can, and probably will, have a somewhat stifling effect on any researcher and could, in an extreme case, even prevent the discovery of the correct solution to a problem. In many instances, the problem is exacerbated by the trend for people to overspecialise. This often means that workers in one field are both unaware of developments in other fields and/or totally ignorant of that field, especially if the secondary field is out of vogue at a particular time. In many ways, this latter remark is true of the study of sound; most know of sound moving in waves and are conversant with some other basic pieces of theory but don’t have that knowledge at the forefront of their minds and don’t contemplate its possible relevance in the explanation of effects in seemingly unrelated fields. Such could well be the case when it comes to providing an explanation for the red-shift. However, it must be noted from the outset that, here, the writer has benefitted enormously from discussions with Allan Sharp of Aberdeen’s oil and gas sector and, indeed, many of the basic ideas originate from his extensive background knowledge in the general field of sound.

These days virtually all thinking in cosmology and astrophysics seems to be based on an unshakeable belief in the truth of the so-called Big Bang theory. This theory – and that is all it is, a theory – seems to dominate everything and people who query it are relegated to the outer darkness of the scientific world. However, the believers still benefit enormously from research funds and this results in extremely expensive experiments being performed; a recent such one purporting to search for gravitational waves resulting from the merger of two black holes. This is intriguing since, as can be seen from the references given in the book *Exploding a Myth* [1], the modern notion of a black hole results from a highly questionable mathematical expression – the so-called Schwarzschild solution to Einstein’s field equations. As has been pointed out repeatedly, the usually quoted expression of this solution is not, in fact, the equation appearing in Schwarzschild’s original paper [2]. Further, although many

pictures of black holes and black hole mergers have appeared, closer examination shows such pictures to be artists' impressions; no black hole has yet been identified beyond reasonable doubt. It is, therefore, not unreasonable to examine other possible explanations for the problems facing astrophysicists and cosmologists.

The Red-Shift.

The oft discussed red-shift of light received from distant galaxies is based on the well-known idea of Doppler shift which has an exact analogy with sound moving through the air. The measured red-shift is interpreted as indicating the velocity, and even acceleration, of galaxies away from the Earth proportional to distance. This is said to confirm an expanding Universe, the origin of which is the Big Bang. At first sight the theory seems reasonable but, after time elapses, problems occur and the need is perceived to add new factors to the model, such as dark matter and dark energy, to resolve these unexpected difficulties. It might be wondered, therefore, at this juncture if other possible explanations exist for the cosmological events in need of understanding?

Returning to the analogy of the passage of sound through air, consider two people conducting a conversation where, at a particular time, one is the speaker (or source of sound) and the other the listener (or receiver). Physically what happens is that the particles of air around the vocal cords of the speaker are excited by the vibrations of those vocal cords. These particles do not then travel at the speed of sound through the air and impinge on the eardrum of the receiver. Rather the particles of air transfer the energy and its characteristics, such as frequency and amplitude, to adjacent particles and the process continues as a wave-front which arrives at the eardrum of the listener and the energy is then converted by this transducer to meaningful information. The actual speed of the wave-front is dependent upon the nature and condition of the particles involved in the transfer of energy between them. Given that the particles which were excited at source originally are not those which deliver the energy to the receiver, is it reasonable to consider whether, or not, the particles (in this case photons) emitted by an electromagnetic source are the same as those received by our Earth based instrumentation?

Ever since the total acceptance of Einstein's theories of relativity the scientific community has rejected the idea of the existence of an æther. However, doubt has been cast on this and, indeed, on the popular account of the famous Michelson-Morley experiment by the relatively recent work of R. T. Cahill [3], who has reanalysed all the data and concluded that, when correctly interpreted, the results of the experiment do indicate that absolute motion relative to space was observed. Hence, what consequences might the existence of an æther have? The æther would permit the flow of electromagnetic waves but what is it exactly? It has been proposed that the æther is composed of particles which might be analogous to an elastic solid or, alternatively, a perfect gas. Both ideas are analogies with material. However, solids also transmit energy as sound, as the field of ultrasonics can testify. As in air, the atoms in a sample of steel (say) to be subject to ultrasonic examination which are excited by the source crystal are not the same as those which transmit the sound to the receiving crystal. The atoms excited by ultrasound transfer the characteristics of the ultrasound to contiguous atoms but, crucially, with a damping effect indicative of the nature of both the nature and condition of the material.

Therefore, suppose the æther to be composed of photons as the continuum, pervading all space and interacting with matter to confer upon it its mobility and potential for activity.

Taking a random source star as an example; the star emits electromagnetic energy to the photon field and this energy with all its characteristics is then transmitted by photons through the photon field, or æther, at the speed of light, that speed being directly dependent on the condition of the photon field. It might be noted that the transmission of energy is at the speed of light: the photons do not require movement in order to effect this energy transmission although they are not necessarily static. As far as we are concerned with our senses, the photonic æther is effectively frictionless and fully able to transmit energy by the mechanism outlined. However, the vast distances and times of cosmology might reveal this supposition to be not entirely accurate.

The light originating from distant galaxies is seen to be red-shifted. Now white light is a composite as becomes apparent when its bandwidth of components is revealed by a prism and by the recombination of these components back to white light. The higher frequency end is ultra-violet while the lower frequency end is the infra-red. As light travels towards us through the intervening medium, the higher frequency end is attenuated more than the lower frequency end, thus resulting in an apparent red-shift. Whilst Doppler effects simply cannot be denied, the greater effects are due, in all probability, to frequency related attenuation which is well-known from technical fields such as radiography and ultrasonics.

As far as the notion of attenuation is concerned, Nernst's and Born's idea of 'tired light' might be thought of as being an early though flawed proposal, since 'tired' has no defined technical meaning although the notion was, and is, well understood by workers in the field. However, 'attenuated' certainly does have much immediately obvious meaning in that frequency-attenuated light would be immediately understood by many in various scientific sectors. It does show, though, that great physicists of earlier days were on the right track as might be seen by reading *Reflections and Thoughts on Tired Light* [4] and consulting references contained there.

One drawback for this explanation might well be that it implies no expanding universe and no Big Bang. However, it has the advantage that it depends on the existence of photons which most accept and, simply put, the idea relates light to photons just as sound is related to air particles. It follows that photons are the transmitters of light, and indeed all electromagnetic radiation, just as the air particles are the transmitters of sound and the physical process is exactly the same in both cases. A moment's thought shows how this approach also offers a fundamental explanation of the so-called wave-particle duality property of light.

Conclusion.

Here, as a result of discussions, a proposal, originating with someone having a good basic knowledge of the theory of sound, has been expanded to give a plausible explanation for the red-shift observed and discussed widely in cosmology and astrophysics. The ideas presented here are, in a sense, preliminary thoughts and the proposal would benefit from further thought and study. Also, other known effects associated with light will need to be investigated afresh utilising the ideas presented here. However, apart from anything else, it serves to illustrate how one field can benefit from input from other, seemingly unrelated, fields. It is interesting also to note that many of the ideas accord with those presented recently by Espen Haug in his book *Unified Revolution* as well as in several publications, in which he seeks to reintroduce the ideas of atomism, albeit in a somewhat modified form.

References.

- [1] J. Dunning-Davies, 2007, *Exploding a Myth*, Horwood, Chichester.
- [2] K. Schwarzschild, 1916, Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften zu Berlin, Phys – Math. Klasse, 189
(translation: S. Antoci & A Loinger, arXiv:physics/9905030)
- [3] R. T. Cahill, 2004, *Apeiron*, **11**, 53-111.
- [4] M. Moore & J. Dunning-Davies, *Reflections and Thoughts on Tired Light*
<http://arXiv.org> physics 0707.3351
- [5] E. Haug, 2014, *Unified Revolution*, E G H Publishing.