

Electric and Magnetic Senses in Humans

by Sky Shields

...*Heard melodies are sweet, but those unheard
Are sweeter; therefore, ye soft pipes, play on; ...*
—from John Keats, “Ode on a Grecian Urn.”

With a number of elements now in mind—the recognition of the impossibility of attributing “five senses” to the human individual, and the deep connection which exists between various forms of animal life and the incredibly complex network of electromagnetic and other phenomena which we have referred to collectively in this report as “cosmic radiation”—we now turn to some of the very interesting topics which we will face over the course of the next several decades of human development.

As mentioned elsewhere in this report, mankind’s successful expansion into the Solar System will require a very different concept of the relationship between biological processes and their electromagnetic environment. It will require a better understanding of the biological aspects of electromagnetism, and the recognition that, among the bodies of our Solar System and beyond, there is no “empty space.” There is, rather, an intricate, ever-changing, anti-entropically evolving, dynamic system of cosmic radiation, which might be likened in its character to cell cytoplasm, whose dynamic character is equally difficult to account for, and which is likewise often ignored in favor of an examination of the easier to characterize organelles which it contains. Our first brush with this, however, will come very clearly as a result of the first steps which humanity will take in connection with the North American Water and Power Alliance (NAWAPA), and its further migration poleward.

Sensing the Cosmos

There are reports going back hundreds of years, of people “hearing” the Aurora Borealis, including studies by Benjamin Franklin, and a

discussion by Alexander von Humboldt in his *Cosmos*. Usually, they describe either a rustling sound, or static, or “dry leaves,” and this is usually combined with specific other conditions: especially bright auroras, and usually exceptionally cold days. Only certain people report being able to hear these, however, and *no recording device picks up the sounds as described*, which has occasionally led to people being ridiculed, whenever they bring up the subject. The effect has now, however, been verified by repeated experiments, using human test subjects, instead of recording devices, and it is no longer questioned as to its veracity. The cause, however, is unknown.

There are physical reasons that the aurorae *should not* be able to produce what is typically (erroneously) described as sound—i.e., the vibration of the air—considering that the portion of the atmosphere where they occur is much too thin to be able to transmit sound waves. This implies both that something other than air vibrations is being transmitted as a result of the Sun’s interaction with the Earth’s poles, as well as that, what human beings experience as sound, includes more than the vibrations which are picked up by recording devices. The implications for recorded versus live music are obvious. It would also be interesting to investigate whether the sound produced by the human singing voice contains similar non-vibrational, possibly elec-



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There are numerous reports, going back thousands of years, of people “hearing” the aurorae and also, meteors, including those in ancient Chinese chronicles, which describe the sounds, poetically, as “like a flock of cranes.” Yet, there is no empirical confirmation of these reports. What is it that accounts for such “extrasensory” phenomena?

tromagnetic aspects.

Related to this, and likewise unexplained, is the fact that people can “hear” meteors. There are observations going back over a thousand years,¹ such as those recorded in ancient Chinese chronicles, which describe sounds “like a flock of cranes,” simultaneous with a meteor’s passage.

Edmund Halley reported, in 1719, that multiple observers claimed to have heard a meteor “hiss as it went along, as though it had been very near at hand.” However, the location of the observers, combined with the angle at which they reported seeing the meteors, required that the meteor be much too high for the sound to arrive simultaneously with the visual appearance of the meteor. In fact, the altitude of the meteor, at the point at which such sounds are heard, is between 80-100 miles, roughly where they would be passing through the Earth’s ionosphere. If sound were capable of being transmitted through such a thin atmosphere, it would still require upwards of five minutes to reach an observer on the ground, long after the meteor had faded from sight. That is, the sound of meteors does not follow the lightning-thunder rule, which most people use to estimate the distance of a lightning strike, where the time between seeing a lightning flash, and hearing thunder, is a result of the fact that light travels faster than sound. In the case of meteors, although there is often a more traditional sonic boom which is heard several minutes after the meteor’s passage, there is another sound which is heard simultaneously with the observation. This means that the “sound” is traveling at the same speed as the light, suggesting that this could be another case of the direct perception of electromagnetic radiation, similar to what occurs with the aurorae and microwave hearing.

Because of the paradoxes involved, a number of prominent figures, including Halley, sought to dismiss such sounds as imaginary. As with the aurorae, many people claimed that the sheer impressiveness of such a sight—a heavenly fireball, since the loudest sounds seemed to be associated with the brightest of them—should be enough to provoke an imaginary sensation of sound. Further, said Halley, “Others imagin’d they felt the Warmth of its Beams, and some there were that thought, at least wrote, that they were scalded by it.” This latter was enough for Halley to dismiss the sensation as fictitious.

Along with the reported sounds, however, those

physical sensations connected to meteor passage continued until the present day, with a 1977 account describing a warm “puff of wind . . . towards the end of the duration of the sound,” and others describing similar tactile phenomena, such as perceived changes in air pressure and vibrations of the air,² or “a slight electric shock.”³ Further, and probably even more inexplicable to Halley, there are several reports of the sensation of specific smells—sulfur and ozone—occurring simultaneously with bright meteors. This smell, and the fact that it occurs simultaneously with the appearance of the meteorites about a 100 miles away, points to the likelihood of an electrical disturbance which propagates through the atmosphere at the speed of light, in the form of electromagnetic waves. The smell of ozone is possibly the effect of intense ionization of the atmosphere in the vicinity of the observer. These electromagnetic effects within the atmosphere, far from being accidental, may play a very important role in the organization and evolution of the entire Biosphere, as will be discussed below.

The specific characteristics of such sounds also make clear the impossibility of their being imagined. Observers have repeatedly described being prompted to look up at a meteor, after first hearing it. Other observers have described hearing the sound of the passing meteor from within their houses. One observer describes being “compelled” to rise from his bed and look out of a window in time to see and hear several meteors, and this report is not the only one of its kind.⁴ Chickens and dogs have also been known to exhibit alarm prior to a meteor strike, despite not having observed the meteor directly.⁵ This fits with the known behavior of both chickens and dogs with regard to lightning strikes, where both become alarmed shortly before a strike, including at least one case in which a researcher observed a dog barking at the location of a strike before it occurred.⁶ This indicates again that the meteor strike must be having an electromagnetic effect similar to that of a lightning strike.

2. D. Vinkovic et al., “Global Electronic Fireball Survey: a review of witness reports—I.” WGN, *Journal of the International Meteor Organization*, 2002.

3. M. Romig, D. Lamar, “Anomalous Sounds and Electromagnetic Effects Associated with Fireball Entry,” ARPA Memorandum RM-3724-ARPA, 1963.

4. D. Vinkovic et al., op. cit.

5. Romig, op. cit.

6. A. McAdie, “Phenomena Preceding Lightning,” *Monthly Weather Review*, 1928.

1. http://www.gefsproject.org/electrophones/index_history.html

That the sounds observed by meteors also have such an electromagnetic character is supported by the fact that in the case of lightning strikes, a small “vit” or “click” sound can often be heard simultaneously with the strike, much earlier than the time it eventually takes the peal of thunder to reach the listener. One explanation being put forward for this phenomenon, besides a direct perception on the part of the observer, is called electromagnetic transduction, and states that objects in the hearer’s immediate environment may be resonating with the electromagnetic disturbance created by the meteor or aurora, and converting the disturbance into sound waves via their own vibrations. This would be somewhat different than directly “hearing” the electromagnetic effect, but might be even more interesting from the standpoint of the ability of the Biosphere to resonate with these sorts of phenomena.

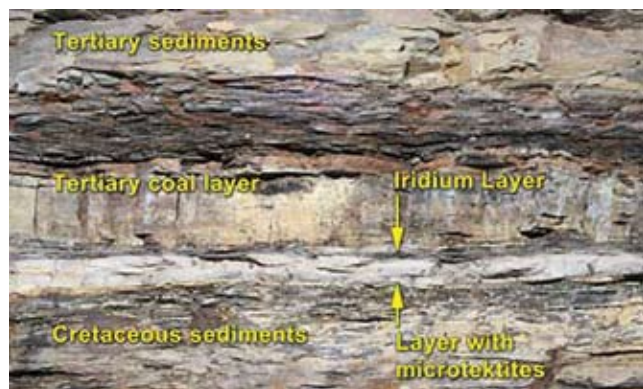
There are several problems with the specifics of this theory, however. As in the case of the aurora, actual audio from a meteor has yet to be recorded. Because of this, it cannot be said that the sound produced is of the “traditional” sort, carried by vibrations in the air. Also, as with the aurora, in groups of several observers, it is often the case that only some of them will hear the associated sound, though there is always great qualitative agreement among those who do report hearing it, even when they are spaced as far apart as opposite sides of a city or small country.

Either way, it is clear that what is being sensed as sound by the listeners in all of these cases—fireballs, the aurora, lightning, earthquakes, etc.—is connected to major disturbances involving large sections, and perhaps the entirety, of the Earth’s electromagnetic environment. Colin Keay’s theory involves a very interesting description of the turbulent plasma generated in the wake of a meteor as it passes through the extremely active plasma of the Earth’s ionosphere. This is the height—70 to 110 miles above the ground—where the meteors are observed at the same time that anomalous sounds are perceived, and it is the same region where the ionized particles which are supposed to be driven into the Earth’s atmosphere, due to its interaction with the Sun, produce the effect seen and heard as the aurora.

Meteors as Organizing Agents

Interesting in connection with this, is the extinction event which “killed off the dinosaurs,” and which constitutes the transition between the Cretaceous and Ter-

tiary periods—the K-T boundary. Evidence from the fossil records shows a “sudden” increase in the element iridium, typically found on incoming meteorites. For this, and other reasons, the extinction of the dinosaurs is now generally agreed to have been at least partially the result of a major asteroid impact. However, the increase and decrease of iridium in the fossil records, though sudden, on geological timescales (a period of 100,000 years), is actually much more gradual than one would expect for a single large impact, and other evidence points to the possibility of an extended interaction with an extraterrestrial source.⁷ Likewise, the patterns of extinction and emergence of new species indicate that something more unusual may have taken place during that entire span.⁸



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The geological transformation at the boundary between the Cretaceous and Tertiary periods (K-T boundary) is very sharp, and it is marked by a layer of iridium, thought to be extraterrestrial in origin.

For us, it is also interesting to note that the K-T boundary falls neatly within the 62My (million-year) cycle discovered by Rohde and Muller (within 2My of the center of the cycle, which may correspond to the passage of our Solar System through the galactic plane).⁹ This implies that whatever event caused the massive change at the K-T boundary was not a random collision, but rather part of a much larger process of

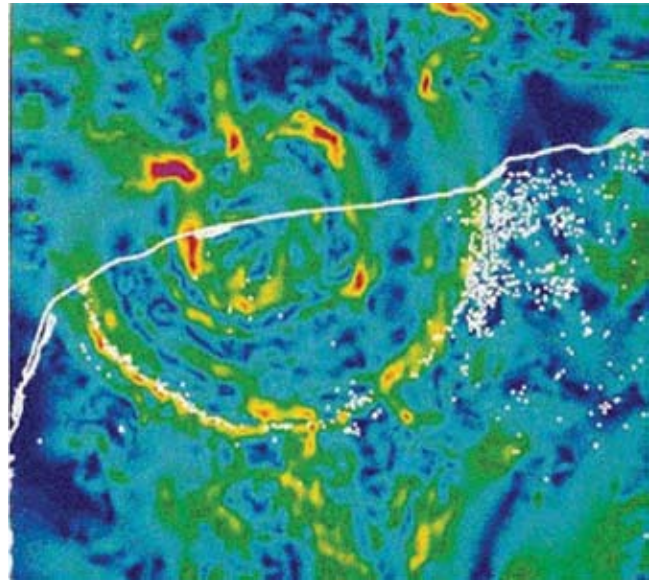
7. M. Wallis, “Exotic Amino Acids Across the K/T Boundary—Cometary Origin and Relevance for Species Extinction,” *International Journal of Astrobiology*, 2007. Wallis is not presenting the argument I am making here, but his paper is very interesting in this context, and in the context of what follows.

8. For an interesting survey of the disputed details around the K/T mass extinction, see N. MacLeod, “K/T Redux” *Paleobiology*, 1996.

9. Sky Shields, “Kesha Rogers’ Victory Signals the Rebirth of a Mars Colonization Policy,” *EIR*, March 19, 2010.



On June 30, 1908, a mysterious object—producing the same anomalous sounds as heard from meteors—detonated, felling trees in a 40 km radius, in Siberia. From its effects, the energy released in the blast is believed to have been several orders of magnitude greater than the atomic bomb dropped on Hiroshima. Unusual growth patterns have been observed near the blast epicenter, and along the observed flight path of the object. Shown: The “Tunguska event,” which flattened a Siberian forest.



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Like most major craters on Earth, the Chicxulub crater (shown here) cannot be seen, because it has been covered over by Earth’s incredibly active biosphere, but it can be viewed as a gravitational anomaly, as in this gravity map. The crater underneath the Chesapeake Bay, near Washington, D.C., is likewise invisible, though it may be responsible for the much later formation of the Bay, 18,000 years ago.

creative evolution.

Given the sensitivity of living processes to electromagnetic effects of the sort connected to meteor impacts, what would be the effect of a long-term interaction such as that which bridges the K-T boundary? An interesting discussion of the potential biological ramifications of the electromagnetic phenomena connected to a meteor impact was carried out during the decades that followed the mysterious Tunguska event in Siberia.¹⁰

Although the evidence there is not conclusive, there is much other evidence that rapid growth, such as that observed at the Tunguska site, is positively related to exposure to the same sort of low-frequency electromagnetic phenomena as those hypothesized to be generated by electrophonic meteors (although at higher intensities),¹¹ and has been theorized to account for the gigantism observed during the Cretaceous period, and which ended abruptly (in geological terms) at the K-T boundary.¹²

10. Z.K. Silgadze, “Tunguska Genetic Anomaly and Electrochonic Meteors,” *Acta Physica Polonica B*, 2005.

11. Anomalous, electrochonic sounds were reported by observers up to 100 km from the flight path of the Tunguska object. Cf. Romig, op. cit., p. 13.

12. T. Nishimura, K. Mohri, M. Fukushima, “The Mystery of the Dinosaurs: The Earth’s Electromagnetic Field May Explain Their Gigantism and Extinction,” *Viva Origino*, 2009.

It is very interesting to note, in this context, that continuing the cycle another 62My from the K-T boundary finds another major evolutionary change—the appearance of *Homo habilis*, or tool-making man. This coordinates with the first evidence of the emergence of the Noosphere—the subjection of the Biosphere to the dominance of willful creativity, in the form of the creative human individual—within major intergalactic processes. Further investigation will have to determine whether or not this is coincidental.¹³

In general, this should not come as a surprise. As reflected in the central theme in this report, animal navigation and physiological function, in general, are closely tied to such long-term cycles and electromagnetic effects. Also, the Biosphere is not a passive player in these effects. There is reason to believe that a signifi-

13. If you’d like something else interesting, take the two events—the K-T extinction and the appearance of *Homo habilis*—which are roughly 62My apart, and then look at their half-way point, which should correspond to another mid-plane crossing. There, we find a sharp singularity which corresponds to the sudden appearance of an ice sheet in Antarctica, the mass extinction of most species on that continent, and the beginning of the Oligocene. This correlates likewise to a meteor bombardment which included the giant bolide which created the impact crater that now lies deep beneath the Chesapeake Bay, just east of Washington, D.C.

cant portion of the perturbations in the Earth's magnetic field is attributable to long-distance flows within the Earth's oceans.¹⁴

Further, there is also reason to believe that up to one-third of the motion within the Earth's oceans is attributable not to wind, or simple heat convection, but rather to the motion of large masses of various sea creatures.¹⁵ The more significant of these creatures may also follow migratory patterns, which themselves are already determined by the Earth's magnetic field (whose source is still unknown), such as the sharks and sea turtles mentioned elsewhere in this report. Apart from that, it is enough to note that the Earth's oceans and atmosphere are entirely the creation of life, and their composition is far from accidental. The result is that we are driven to recognize that the Biosphere is largely an electromagnetic phenomenon, more so than has heretofore been recognized.

The atmosphere whose charge differentials create the stunning phenomenon of lightning is entirely a creation of living processes. Likewise, this same atmosphere, produced by life, is the active player in auroral displays and the meteor effects we have discussed so far. Without the action of life, there would be no large-scale electromagnetic effects of meteorite collisions with the Earth, and the Earth's visible aurorae would not exist. It is even plausible to hypothesize that, without life, the Earth's peculiar and active magnetic field—whose source is still entirely unknown—would not exist.

We must consider that these electromagnetic effects are at least as intentional as, say, the creation of mammals, which depended upon the complex series of evolutionary events leading up to the development of a nitrogen- and oxygen-rich atmosphere on Earth.

Sensing the Cosmos

But now, in that context, think of the relationship Vernadsky identified among the abiotic, the Biosphere, and the Noösphere. As the Noösphere gradually increases its conscious control over the Biosphere, the entire domain of activity which once belonged to the Biosphere must become subject to the anti-entropic, willfully creative activity of the human mind. This

means that the conscious control of electromagnetic effects on exactly this intergalactic scale is part and parcel of mankind's destiny: It is human nature. The beginnings of such a process are only hinted at by the recognition that the same electrophonic effects which we have been discussing, and which were once only the product of meteor impacts, have been observed in connection with the re-entry of man-made satellites into Earth's atmosphere.¹⁶

The aurorae are more evidently connected with these large-scale atmospheric electromagnetic phenomena, and the similarity of the two reported types of electrophonic hearing, as well as the other similarities among the anomalous sounds connected with aurorae, lightning, and meteors, prompt us to recognize similar electromagnetic perturbations of the Earth's atmosphere and magnetic field in each of these cases.

There are also plenty of other similar phenomena which have the exact same characteristics, and which ultimately require us to redefine what we consider to be our sense perceptions. That is, we have to rethink the idea that we come with a fixed set of five, distinct senses, whose operation are fundamentally understood. In all of these cases, there is plenty of reason for us to think that what we commonly call "hearing" is much more than the detection of vibrations in air.

For instance, workers near microwave towers frequently have described "hearing" clicking and popping sounds, which could not be recorded by any mechanical device designed to record the vibrations of air waves. This effect—called the microwave auditory effect—has been well studied, although its cause is still not understood. (It is usually claimed that it is the effect of thermal expansion of tissues in the head, though this does not seem to be a certain conclusion.) It was heavily researched by both the U.S. and Soviet militaries, as part of attempts to develop non-lethal (or "less than lethal") weapon systems. In particular, it was thought that it could be used as a form of communication, or simulated telepathy, in which sounds were produced directly within a target's head from afar.

One option that was looked into extensively was the possibility of inducing some of the effects of schizophrenia, and causing a person (possibly a high-ranking

14. G. Ryskin, "Secular variation of the Earth's magnetic field: induced by the ocean flow?" *New Journal of Physics*, 2009.

15. LPAC-TV, "The Cosmic Implications of NAWAPA," <http://larouchepac.com/node/16848>

16. A. Verveer, P.A. Bland, A.W.R. Bevan, "Electrophonic Sounds from the Reentry of the Molniya 1-67 Satellite Over Australia: Confirmation of the Electromagnetic Link," *Meteoritics & Planetary Science*, 2000.

figure in an enemy country) to believe that they were constantly hearing voices. Officially, though, there was only success at getting targets to hear poorly enunciated individual words. The official conclusion is that you would actually microwave the targets (in the colloquial, kitchen appliance sense), killing them, or causing serious damage, long before they were able to hear detailed sentences.

This may be a cover story, and, in any event, it does not exclude the possibility that there are more subtle auditory effects of this kind of radiation, which may even already play a fundamental role in human perception. Likewise, humans, when exposed to certain static electric fields, are able to hear sounds of various frequencies, and experience sensations on the skin.¹⁷

Individuals with defective hearing in high frequency ranges are apparently not susceptible to experiencing a radio-frequency auditory effect. There seems to be only one experiment detailing this, and it is found on a personal website. The experimenter admirably thought to attempt to recreate the perceived sound by normal sound-generation methods, and reports that the listener noticed that this sound, in comparison with the equivalent tone generated by electromagnet stimulation, “seemed to lack something in the high frequency region.”¹⁸ He notes that it is difficult to devise an experiment to detect whether the nervous system is directly stimulated by this sort of radiation, because all of the measuring devices used to detect nervous system activity are electromagnetic in nature, and thus affected by the electromagnetic stimulus used, making it difficult to separate out any stimulated nervous system activity that might occur.

In general, the cases of the conscious perception of these sorts of effects seem much less interesting than the unconscious aspects of this sort of sensation. The case of the microwave hearing indicates that inaudible sensations must be being produced constantly at low power levels, and whatever causes the sound of the aurora is probably occurring for all observers, though on a lower than perceptible level. Could this shape our

perception constantly, without us realizing it?¹⁹

This again points up the serious fallacy involved in defining uniquely cognitive phenomena, such as communication via sound, on the basis of abiotic measurement and instrumentation. This involves a tacit reductionism which is ultimately untenable.

Unheard Melodies

The cultural implications of this investigation are not to be ignored. The organization of human society depends upon its ability to transmit profound moral, scientific, and cultural ideas. There is no physical structure that can be identified as a “nation-state” or a “culture.” The boundaries of a nation or society do not exist physically, but rather as an idea in the minds of the citizens. If this idea is destroyed, so is the nation, and human society, more generally. The ability to achieve such a national idea depends on the maintenance of a coherent language culture, and the tools which help to maintain it—public education, but most importantly the arts, and artistic composition generally. A collapse in the artistic and cultural level of a society will always express itself as a collapse in the physical and economic conditions of that society. A study of this relationship is the particular expertise of the economist Lyndon LaRouche.

If a language loses its capability to express ironies, or the population loses its ability to recognize them, science suffers, because it is just such an ability to recognize and respond creatively to the ironies and paradoxes presented by the universe—as opposed to dry, logical deduction—that represents the basis for true scientific creativity. But such an ability depends upon a recognition of the subtle ironies of human sense perception which, as we have seen, are much more nuanced than they would at first appear.

For instance, if hearing has (as the above investigation would seem to clearly indicate) an electromagnetic component, to which people are able to respond both consciously and unconsciously, what might be lost as a result of digital recordings (or perhaps any recordings) of Classical musical compositions? It has been demonstrated repeatedly that even the mere exposure to Classical musical composition beginning in childhood has a

17. H.C. Sommer, H.E von Gierke, “Hearing Sensations in Electric Fields,” *Aerospace Medicine*, 1964; and T. Moore, “Vibratory Stimulation of the Skin by Electrostatic Field: Effects of Size of Electrode and Site of Stimulation on Thresholds,” *American Journal of Psychology*, 1968.

18. http://www.bibliotecapleyades.net/scalar_tech/the_hum/ingalls.htm

19. Even traditional sound waves, at inaudible frequencies, are capable of generating visceral effects, despite not being consciously sensed. Infrasound of 18 Hz is just below the threshold of human hearing, but has been demonstrated to cause feelings of anxiety and foreboding in test subjects, despite their being unable to “hear” it.

dramatic effect on the cognitive capabilities of the human individual, and history has demonstrated, without question, that active participation in Classical musical performance is a necessity for true scientific and political genius.

But the characteristic of such composition is centuries of scientific work on the creation of instruments which physically mimic the human singing apparatus. This apparatus itself may even have an electromagnetic component to the sounds produced.²⁰ How much of this nuance is lost in the recording of such composition? This is to say nothing of music that is entirely composed on digital instruments, and thus incapable of even approximating the effect of an actual human singing apparatus.

Even the cases where a human singing voice is involved in modern music, all nuance is digitally reduced by the fact that a modern singer, as opposed to a singer trained in the *bel canto* Classical singing method, requires his or her voice to be transmitted to a crowd via microphone.²¹ This is a step above the ridiculously comical recent development of “auto-tuning,” which takes performers who sing out of tune, and digitally adjusts their voices to match the desired digitally correct pitch.

One RAND Corporation report²² on the human hearing of electrophonic meteors noted that the reports of such sounds have decreased in the modern period. They astutely cite three reasons:

1. Popular opinion. As people become more “educated” about the dominant textbook descriptions of physical science, they are less apt to trust their own observations, and instead, explain away any phenomena that may seem anomalous, or potentially subject them to ridicule. This is a side-effect of textbook learning methods.

2. As humans are exposed to more and more noise in certain aspects of perception, they lose the ability to note subtle distinctions, and likely become deaf to certain more subtle sounds.

3. People today will typically find themselves indoors on the computer or watching television, at times when past generations might have been outside taking a stroll.

20. See Aaron Halevy’s contribution in this issue.

21. A humorous example of this modern dependence on a microphone, even for live performances, can be seen in video recordings of the *bel canto*-trained tenor Luciano Pavarotti singing alongside “modern” singers, such as Bryan Adams, available online.

22. M.F. Romig, D.L. Lamar, “Strange Sounds from the Sky,” *Sky and Telescope*, 1964.

That said, the idea that all sound, but not only sound, has an electromagnetic component is not so strange. But, further, if the electromagnetic effects do not register as sounds, due to their subtlety, what do we experience them as? A hunch? A bad mood? A depressed state? An intuition of danger? A feeling of anxiety? A deep sense that massive change of some sort is in the air? A pressing desire to fly South for the Winter, and mate on another landmass?

What would be the effect of losing these sensitivities?

Helen Keller is an interesting illustration in this context. That she was able to develop a concept of her own identity as distinct from her sense perception is, without a doubt, attributable to her own creative capabilities. It is also, however, attributable to the action of organized human society, and the work of her teacher Anne Sullivan, who managed to impart certain socially maintained concepts to Keller, starting at a very young age.²³ What would happen if everyone at that time lacked both vision and hearing, as well as Sullivan’s Platonic sense of the soul? We risk entering a comparable situation today.

NAWAPA: Man as a Creature of the Cosmos

The migration of humanity that will be involved in NAWAPA—approaching both poles, via bridging both the Bering Strait and the Darien Gap—will, lawfully, permit us to consider some of these questions much, much more deeply. If nothing else, this whole investigation points out the necessity of a human presence in the most diverse areas to be studied. The validity of the various types of sounds discussed here was only confirmed by the observation of a dense population of educated observers. This is the same sort of population density and level of economic development which we require in unexplored regions such as the Arctic and, ultimately, interstellar space.

Unless we are especially lucky, our constructed measuring apparatuses will only return to us what we think to ask them, and this will frequently appear to have the effect of a confirmation of the theory that went into the construction of the device in the first place. Asking the question, “What sort of a rock is this child?” may return an answer, but what will be its significance?

23. See the contribution by Meghan Rouillard, “Helen Keller: Mind Over Instrumentation,” in this issue.