

NOESIS

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IN THIS ISSUE:

THE MAKING OF OPTICAL ILLUSIONS &

***THE BLESSINGS OF FRICTION IN OUR LIVES* by RON YANNONE**

LETTER FROM MELIH YAÇINELI, PHYSICS OLYMPIAD TRAINER

PAUL MAXIM'S RESPONSES TO ROBERT LOW AND CHRIS HARDING

***MALLARMÉ'S CRYPTOPUZZLE ON THE U.S. CIVIL WAR* by MAXIM**

THE ELECTRON* by ROBERT HANNON

*Ed's comment--This is Hannon in a new, non-relativistic vein--more metaphysical, no equations, no debunking of Einstein.

THE MAKING OF OPTICAL ILLUSIONS

By Ronald Yannone, 53 Amherst Street, Nashua, NH 03060, USA

Various forms of optical devices had been invented well before the 1800's, most notably the camera obscura and the magical lantern. It was only in the early 19th century that there were discoveries regarding the effects of *both* light and movement on human perception. Though optical studies and devices were being produced by the likes of knights and priests, scientists were involved as well. Both Sir Charles Wheatstone and Michael Faraday showed the illusion of immobility given to a moving object by brief flashes of light. (e.g., "*Faraday's Wheel*") It was Dr. Peter Roget's (of Thesaurus fame) 1825 paper, "Explanation of an optical deception in the appearance of the spokes of a wheel seen through vertical apertures" that formalized the idea of persistence of vision. The "vertical apertures" that Dr. Roget was observing were picket fence posts. Here is an excerpt of his observations:

"A curious optical deception takes place when a carriage wheel, rolling along the ground, is viewed through the intervals of a series of vertical bars, such as though of a palisade, or of a Venetian window blind. Under these circumstances the spokes of the wheel, instead of appearing straight, as they would naturally do if no bars intervened, seem to have a considerable degree of curvature. The distinctness of this appearance is influenced by several circumstances presently to be noticed; but when everything concurs to favor it, the illusion is irresistible, and from the difficulty of detecting its real cause, is exceedingly striking.

...The true principle then, on which this phenomenon depends, is the same as that to which is referable the illusion that occurs when a bright object is wheeled rapidly around in a circle, giving rise to the appearance of a line of light throughout the whole circumference: namely that an impression made by a pencil of rays of the retina, if sufficiently vivid, will remain for a certain time after the cause has ceased...."

This physiological reaction to light is the cornerstone to the phenomenon of motion pictures. Without it, the movies would simply not exist. It was through its discovery there arose the development of a device that would "divide" the images of successive movement and subsequently allow for their "recombination".

In 1826 this phenomenon was introduced to the public of Great Britain by Dr. John Ayrton Paris with his toy *thaumatrope*, or spinning wonder. Images on opposite sides of a paper disc would combine to form a complete picture when the disc was spun.

The introduction of the first motion picture came in 1832, albeit with drawn cartoons. There were two coincidental claims to the invention of the phenakistoscope: one by Ritter von Stampfer, of Belgium, with his stroboscope, and the other by Dr. Joseph Antoine Plateau of Austria. Although each inventor's animated picture disc appeared in the scientific journals at almost the same time, it was Joseph Plateau who ultimately did the most extensive research into human vision. (In fact, so much so that he went blind after staring at the sun in his study of persistence of vision). The following are his words to describe the nature of the phenakistoscope.

...The apparatus which produces this type of effect consists essentially, as we know, of a cardboard disc pierced around its circumference with a certain number of small openings and painted on one of its faces with figures. When you make the disc spin on its center in front of a mirror while looking through the openings, the reflected figures, instead of becoming blurred as they would if you looked at the spinning circle in any other way, on the contrary, seem to stop participating in the rotation of the circle, become animated and perform their characteristic movements. The principle on which this illusion is based is extremely simple. If many objects, which differ gradually in form or position are displayed successively to the eye during very short intervals of time spaced sufficiently close together, the successive impressions that they produce on the retina will connect themselves without blurring, and you will believe that you see one object gradually changing form or position. It is a wholly natural consequence of the phenomenon well known as persistence of vision which is realized by the instrument in question in the most simple way, as we will see. Indeed, each time that an opening passes in front of the eye, it allows the image of the circle and the figures on it to be seen during a very short time, and since the circle only goes through a small part of its revolution during this passage, it is perceived in the same way as it would be if it were immobile during this small interval of time. Since the same effect recurs for each of the slots, the result is a series of images which appear successively before the eye during very short instances spaced as closely together as desired. In each of these images the figures presented are either distinct or only slightly blurred since each is appreciably the same as if it were part of a fixed circle as I have just demonstrated. Thus in order to be in accord with the conditions of the principle set forth above, one must make the images in such a way that the figures, which occupy similar places with respect to the eye in these successive images of the circle, differ gradually from one to another in form or in position—a condition which is easily fulfilled and which results in the illusion which concerns us here...

Allow me to clarify all this with several examples. Let's say you want to represent dancers doing *pirouettes*. In that case you need only to arrange symmetrically around

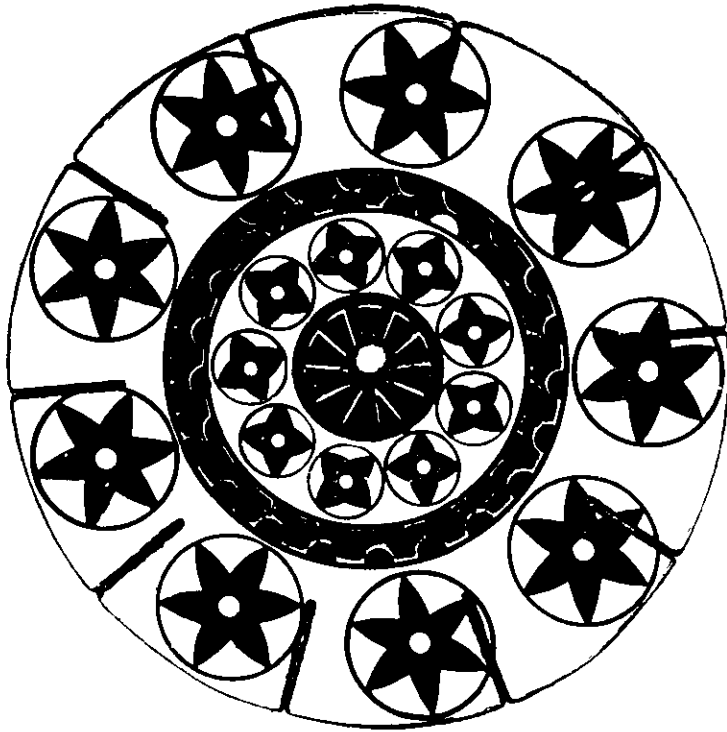
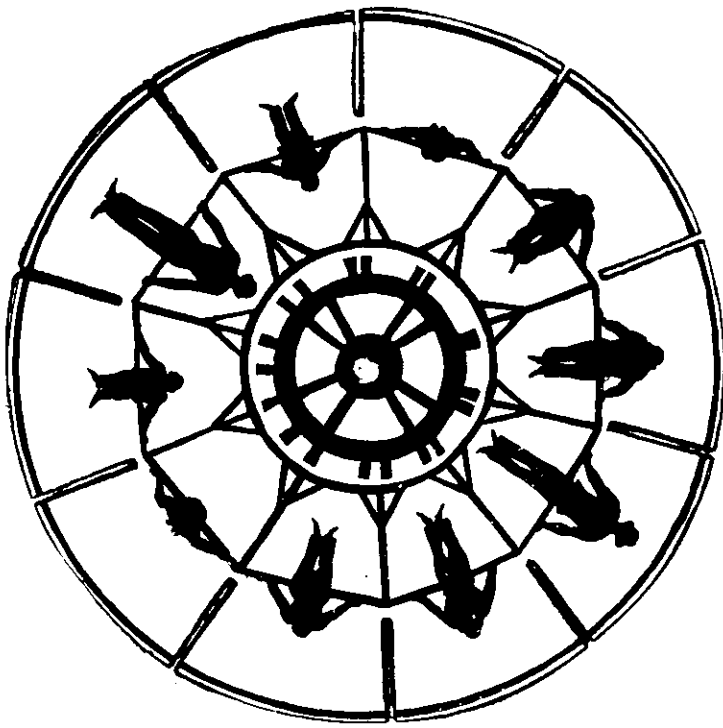
the center a number of figures, equal to the number of slots, which are designed in such a way that you follow the series of figures in a consistent direction — each one of the figures being in a slightly more advanced stage of the pirouette than the one which precedes it — until you return to the figure from which you started. So it is clear that when this circle is put to the test, the small figures have just successively occupied the same place with respect to the eye will present themselves as if more and more turned to one side, and as the eye links all these successive impressions together, the small figures will seem to turn perfectly on themselves.

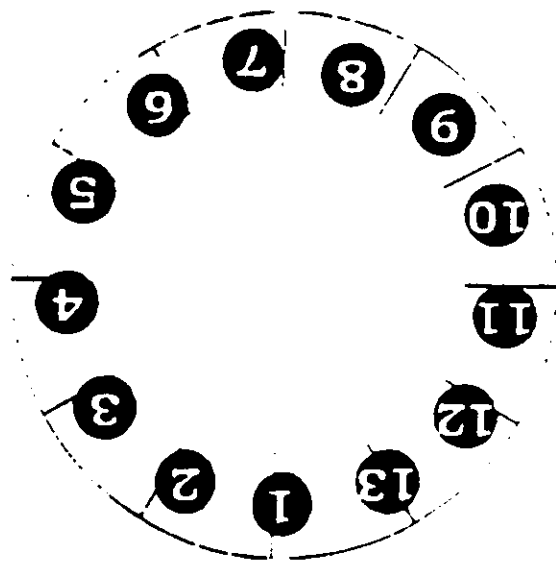
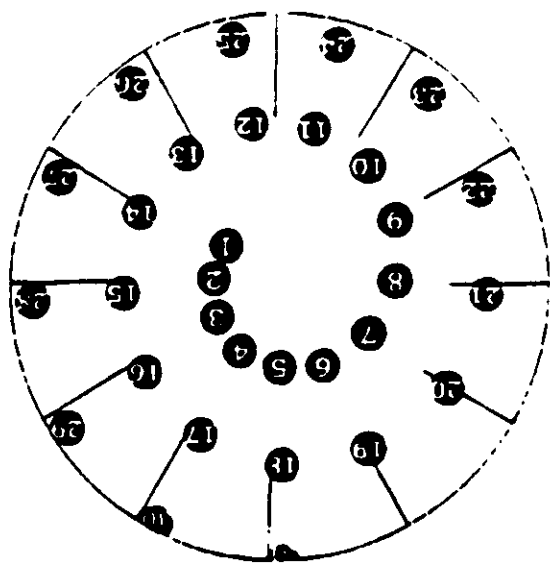
Now do you want to represent men walking? Then the successive little figures no longer need to occupy identical places with respect to the eye; on the contrary, they must be placed in such a way that the positions which they have just filled before the eye are more and more advanced in the same direction — a result which can be obtained by having a greater or lesser number of figures than of openings, depending on which direction you want to make the figures move. As for the movement of the legs, it will be easy to produce according to the same principles. It is sufficient to imagine a step divided into several successive positions and to give these positions to the series of small figures.

...I will finish by remarking that the production of this kind of illusion requires that the speed of rotation be limited in certain ways: if this speed is too slow, the successive images stop connecting and the result is a discontinuous appearance; if it too fast several of the images which take shape successively subsist together on the retina with a more or less equal intensity. The result is that positions which should be successive are seen simultaneously and the figures appear blurred. The speed must be such that the successive images connect but do not blur."

If you are a physics teacher or have children or grandchildren, you might want to make your own phenakistoscope. Can you tell what you'd "see" if the disc patterns were the ones shown below? Ron Hoefflin and Kevin Langdon might be able to make some IQ test thought problems based on the principles of the phenakistoscope. There are some special phenomena to consider with phenakistoscopes due to their circularity and their inherent repetition of the drawings. You can make your drawings not only move within each wedge-frame, but also move across frames, as if they were "travelling" horizontally. This happens through what is called a phase relationship.

The material for this article was extracted from a pamphlet by a company called "Optical Toys". If you are interested in this company write me.





THE BLESSINGS OF FRICTION IN OUR LIVES

By Ronald Yannone, 53 Amherst Street, Nashua, NH 03060, USA

There are many things in life that bring us obvious blessings. Some things that bring us blessings come from sources that are not so obvious. In fact, from appearance, these sources seem very unattractive. One of these unattractive sources is *friction*.

FRICTION - (frik' shen) noun.

- (1) The rubbing of one object or surface against another.
 - (2) Conflict, as between persons having dissimilar ideas or interests; clash.
 - (3) *Physics*. A force tangential to the common boundary of two bodies in contact that resists the motion or the tendency to motion of one relative to the other.
- frictional adj. - frictionally adv.

As an example of (1), I think of the reproductive function. What a joy it is for a mother to hold in her arms the infant she has just given birth to in the maternity ward! Approximately nine months earlier, the baby was conceived and nature took its course. But prior to the conception was a frictional act between the man and the woman through the rubbing of their reproductive organs in the proper manner. The blessing that results from this type of friction is certainly among the most miraculous!

As an example of (2), I think of a number of instances. For example, sports and academics. Although the majority of sports activities and academic institutions incubate the spirit of competition, the element of friction can certainly bring out optimum performance in people. Sometimes the person that we compete with most is ourselves - and our own past record - or a new goal we wish to attain. For me, personally, I know that if it were not for "competing" in a healthy sense with my best friends in grade school, high school and college in tennis and academics, I would not have achieved half of what was accomplished in my life. Observing my closest friends in their pursuit to excel instilled in me an uncanny desire to excel as well. Was there a better way to still achieve success without the spirit of competition? The Bible says there is.

In the Bible, Paul exhorts us to "run a good race" spiritually. We are constantly at odds against Satan and his evil angels, as well as our inherited and cultivated weak and

wrong tendencies. But the friction is there! The desire for wrong to overcome good is ever present, and we all contend with it whether we like it or not. The sense of friction so far discussed can be extremely beneficial if "attacked" from the right direction - in the right spirit. We should "esteem each other better than ourselves" whenever and wherever possible.

*When conflict between persons places unhealthy barriers between them, then both should stand back and assess the real situation at hand. Some of the questions they might ask themselves are: "Am I being selfish?" "Am I accustomed to having the last say?" "Is the person I am dealing with entitled to their opinion as much as I am to mine?" "Could there be angles to the situation that I do not see, or cannot see, or am not aware of?" "Are the issues at hand, petty?" "Should I value the experience that the person I am dealing with has regarding the issue above that which I *feel, sense and believe* is right. Are my feelings enough to go by in this instance?" "Would there be any harm in giving the person I am dealing with the benefit of the doubt?" "Is there Biblical guidance regarding the situation that I should implicitly follow, regardless of my feelings, thoughts, credentials, etc. and those of the person I am dealing with as well. That is to say, where the Bible says what path or action to take, do I let it supersede everything else?"*

As an example of (3), I think of the friction involved with many of the ground transportation vehicles. I live on one of Nashua's busiest streets. There are two on-coming lanes on my side of the street. My driveway (parking spot) is situated on the bend of the road that allows me about 2 seconds response time if the only available cue to me was visual. Fortunately for friction between the wheels of the cars and the roads' surface, there is an acoustic cue as well which affords me an extra 3 to 5 seconds to work with. That is, based solely on the acoustic cue giving me an indication of on-coming traffic, I pull out of my driveway - even though the visual cue is yet absent. Sound scary? After one month in my new apartment, I can attest to the benefits of friction! Of course, just our ability to walk or ride a bicycle, are frictional blessings as well. And think of the places we have seen as a consequence! Those of us who use air transportation do so as the wheels of the airplane provide take-off and landing capability.

Perhaps you would benefit to pause for a few minutes to assess where friction has been a blessing to you and share it with the Mega Society via an article. I, for one, would appreciate your article.

T.C
MİLLÎ EĞİTİM BAKANLIĞI
İzmir Özel Yamanlar Fen Lisesi Müdürlüğü

Subject : Gifted students

Dear Sir

I'm the physics olympiad trainer and the head of the educational programs for gifted students in Yamanlar College, İzmir TURKEY. Our college is a private school and 10 per cent of its students are selected (gifted and talented) and given scholarship by the school. Yamanlar College is one of the schools of ÖZEGİTDER which is the Union of Private Schools in Turkey and in other Countries (Mostly Turkish spoken, neighborhood countries). The number of schools of ÖZEGİTDER in Turkey is about 100 and there are about 200 schools in other countries. In our country almost 2% of the schools are private and others are conducted by government. ÖZEGİTDER schools make 25% of the private schools in Turkey.

In Turkey there are mainly three groups of secondary schools: normal schools, occupational schools, and high level schools. For the selection of high level students there are two kinds of nationwide examinations held each year. The first exam is held after elementary schools. In each age level there are approximately 1.500.000 students and 250.000 of them attend to this exam each year. The second national exam is after secondary schools -8 th class and approximately 80.000 students attend to this one. In 1994 three of the top-ten students and in 1995 for of the top- ten students of the second exam are now in our school.

These nationwide examinations are based on achievement on areas of normal school education knowledge. Almost none of the schools in our country use IQ tests or other personality tests to select gifted students, since there is no such a tradition. Yamanlar College usually take gifted students out of the top 1000 of the first nationwide exam and the top 200 of the second exam. But according to our observations in our school for several years, some students who are very successful in these exams may not be successful in the future, in science olympiads and in the university entrance exams as much as they are expected.

The main program for gifted learners in our school is related with science and math olympiads. In the last five years our school was the top school of Turkey in number of students selected to national teams (i.e. 16 of 25 members of National Physics Olympiad teams were from Yamanlar College) and international medals (two gold, three silver and six bronz medals in three branches of international science and math olympiads)

Although the students go to science olympiads at the age of 17 (11 th or 12 th class), two of our gifted students went to International Physics and Chemistry-Olympiads at the age of 14 before lycee. They both got bronz medals at that age. One of them was Salih ADEM who graduated this year. He attended to international physics olympiads from 1992 to 1995 successively and he got two gold and two bronz medals in these years. The other one Salih ÖZÇUBUKÇU is now 9 th class yet.

1- We want to construct our own selection system for gifted learners. While we use the results of our nationwide exams and some IQ tests, we want to use other available tests we can use in our school to select gifted students (i.e. tests measuring creativity, personality-leadership, arts ability and etc.). We want to get help from experienced institutions in this area.

2- We want to improve our educational programs for gifted students.

3- We want to help our teachers who are supporting gifted learners.

4- We want to cooperate and to have relationships with other schools and institutions having programs for gifted students.

Can you send us, catalog, brochure or information about your activities and programs which may help us to reach our goals.

We would be grateful if you would help us in either of the requests above.

Sincerely

Melih YAĞCINELİ
Physics Olympiad Teacher
Gifted Studies Director

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Responses to Robert Low's Letter in NOESIS No. 119 (p. 13), by PAUL MAXIM.

Mr. Low refers to "your fellow Megarian Marilyn vos Savant..." etc. However, when I consulted the membership list in NOESIS No. 88, I did not find Marilyn's name therein. This raises a variety of questions: * Is Ms. Savant considered to be a member of Mega? If so, when did she join, and on the basis of what credentials? Was she one of those "grandfathered" in when Mega merged with NOETIC? Has Marilyn ever published any credentials other than her youthful Stanford-Binet score, and what age was she when this score was recorded? Does she subscribe to NOESIS, and has she ever made any intellectual contribution to the Mega Society? Is she considered an "honorary" member?

Mr. Low also mentions critically some of the material I have published concerning ISPE. While it is true that, at least on the surface, this material may not seem directly relevant to Mega I believe there may be an object lesson concealed in it, for those who wish to accept it as such. After all, ISPE was once considered a democratic society...that was prior to 1979, when a certain "power play" occurred, engineered by an officer named Steve Whiting, who succeeded in turning ISPE into a closed society, resembling the Soviet Politbureau during the "bad old days" of Communism. This was closely followed by the fiat expulsion of six members (including Langdon and Hoeflin), who were not even presented with charges.

So why is this important to Mega?

Someone once said that "comparisons are odious," but the history of the high-IQ groups demonstrates just how fragile democracy can be. There are always power plays going on, or being planned, by unscrupulous and egotistical individuals, who want to "stack the cards" in their own favor. For example, in 1988, Kevin Langdon and Robert Dick changed the admission requirements of the Prometheus Society, on a de facto basis, so as to exclude applicants with standard test credentials, no matter how high these scores might be. Langdon did this for a very specific reason: He was acting in cahoots with Hoeflin to promote their own tests, at the expense of the standard tests, so as to be able to collect more scoring fees from Prometheus applicants. (Since neither Langdon nor Hoeflin is a Registered Psychologist, nor has a degree in psychometrics, they are legally unqualified to administer standard tests.) From this motive also stemmed the myth (which they have extensively propogandized) that only their tests are capable of differentiating high-level IQ's.

The power-play came in when Messrs. Langdon and Dick imposed these changes on Prometheus without the constitutionally-mandated membership approval; in other words, when constitutional procedure became inconvenient for them, they simply bypassed it. For this reason, Prometheus' current admissions restrictions are just as de facto today as in 1988, which is another way of saying that they are invalid.

As I view Mega, it is a fairly democratic society, and this is principally because the officers who run the Society believe in democracy, freedom of speech, and the like. But as the two examples above clearly demonstrate, conditions can change fast, if the wrong individuals take control. For this reason, I tend to agree with the observer who said, "Those who cannot remember history are condemned to repeat it." Hence, the undemocratic machinations in organizations such as ISPE and Prometheus are directly pertinent to the Mega Society, because we don't want these things to happen here (at least, I don't want them to happen, and I am hopeful that some other individuals affiliated with the Society will agree with me).

(Continued)

Response to Robert Low -- Page 2 -- by PAUL MAXIM

As regards the material I published on the Kormes lawsuit against ISPE, I wonder why Mr. Low finds this inapplicable. After all, he too is a member of ISPE (or at least he was a member, as of the 1994 membership roster), and as such must have heard something about the Kormes case. Was Mr. Low aware that, in announcing the judge's decision to its membership, ISPE deliberately concealed the most important aspects of it, so as to exonerate itself of any wrongdoing in expelling its members by fiat? And if so, why does Mr. Low find it inapplicable for someone else to come forward and disclose the truth?

Admittedly, the judge's verdict should have been published in TELICOM, not in NOESIS, but if TELICOM refused to disclose it, doesn't Mr. Low see any value in an open journal doing what a controlled press refuses to do? I suspect that if Mr. Low worked on Fleet Street, and not in the halls of academe, he might have greater respect for the value of a documentary exposé...and if Mr. Low had ever lived in a totalitarian society, his respect might be greater still. To the best of my recollection, I do not recall Mr. Low ever protesting ISPE's oppression of its membership; in my opinion, one of the chief reasons why ISPE has been able to get away with this for so many years is because rank-and-file members like Mr. Low simply keep their mouths shut. I presume Mr. Low believes that democracy should apply only to the body politic, and not to membership organizations...if this is the case, I must respectfully disagree with him.

Concerning my letter to ISPE's Special Projects Coordinator, the "object lesson" here is that ISPE's demand for centralized control, and for "political correctness" of all its members (even the apolitical ones) is stifling the attainment of its stated objective, and undermining member achievement. If ISPE had simply followed Mensa's "SIG" system, it would have been much further along, but the paranoid mind-set of its corrupt administration refused to allow its project leaders any autonomy, and demanded that they be subservient to the Special Projects Coordinator & the Editor: i.e., not only did the projects have to be "approved," but the members developing them had to be approved as well. ISPE's main fear appears to have been that a project newsletter might publish some criticism of the Glorious Leaders, or of the Inviolable Dogmas, and this is why there have never been any project newsletters. If Mr. Low doesn't want these matters discussed, he places himself under suspicion of sharing the same repressive mind-set.

Mr. Low, are you willing to speak up on behalf of democracy? We in the Colonies would thank you kindly for doing so.

Sincerely,

PAUL MAXIM, P.O. Box 120
New York, N.Y. 10012-0002

[Ed's comment--Marilyn vos Savant was not on the membership list in Noesis #88 because she hadn't paid dues for a few years. I believe she was a charter member of Mega and was in charge of it for awhile. (In 1986, she turned down both my request to become a member and my request for a date.) She achieved a score of 46 out of 48 on Hoeflin's Mega Test, a score which was not matched or surpassed until Eric Hart scored a 47.]

Response to Chris Harding's Letter in NOESIS No. 119 (pp. 20-21), by PAUL MAXIM

I should like to indicate that I have no animus against Chris Harding. Back in 1992, I came to his aid when he was being abused by ISPE. (Following the fiat expulsions of Williams and Kormes, Harding had the temerity to protest these actions, and was thereupon cut off the TELICOM mailing list for about five months. I complained about this to ISPE's trustees, and thereby placed myself at risk. This was one of the incidents which convinced me that ISPE operated like the Gestapo, in that anyone who questioned its methods automatically became its victim.)

Mr. Harding still calls himself a psychometrician, and participated in the development of the Skyscraper and W87 tests. Hence, I was somewhat surprised to learn from him that he had discarded all his testing records from the 1970's and 1980's. It seems to me that a true psychometrician would not have thrown out such valuable data, or would at least have prepared statistical summaries of the data before discarding it, but Mr. Harding admittedly did not do so.

Mr. Harding is also aware that, when he writes for NOESIS, he is addressing a fairly intelligent audience with some exposure to psychometrics. Nevertheless, he speaks of his "post Guinness highest ever performance of 204," without specifying which test this was recorded on, who administered it, and so forth. I am afraid that I find Mr. Harding's remarks to be somewhat disingenuous, and feel that the best thing he could do, at the present time, is to publish all his IQ and educational records. I am not saying that he is necessarily wrong, and I am not saying that he is necessarily false, but I find that, again and again, he makes statements about his credentials in such a way that they cannot be checked by anyone else. Apparently, a lot of people in the high-IQ world have let him get away with this, and so I feel that the current situation is as much their fault as his.

The only thing about Mr. Harding that I am willing to take for granted, at the present time, is that he unjustifiably equated someone's score on the Mobius (an unnormed test) with "196 IQ" on the Stanford-Binet. If this incident is representative of the level of Mr. Harding's probity, then I feel we have the right to demand something more specific from him as regards his own credentials, and I feel he has the obligation to be more forthcoming in the way he presents them to us.

MALLARMÉ'S CRYPTOPUZZLE ON THE U.S. CIVIL WAR

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On Page 24 of NOESIS No. 118 (May 1996), Editor Rick Rosner poses the question: "If ...high-powered analytic techniques (were applied) to poems that have zero probability of hidden messages...what sort of stuff would pop out?"

In a way, this question tends to answer itself, since if the poems (or other texts) have a "zero probability" of containing hidden messages, then there is a zero probability that any consistently significant "hidden messages" would emerge. Most casually-written texts, I would presume, fall into this category.

However, there is a certain category of poetry, usually referred to as "Symbolist," in which the probability is higher than zero, since one of the tenets of Symbolist literary art was to imbue their works with layers of hidden meaning. Mallarmé is generally regarded as the leading French Symbolist poet, but he is not the only one; other 19th century poets whose works have a high probability of containing "hidden messages" include Gérard de Nerval (1808-1855), and Arthur Rimbaud (1854-1891). This field has given rise to a good deal of scholarship; for example, the bibliography of analytical works on Rimbaud (in various languages) probably runs close to a thousand items.

Another famous Symbolist poet is Dante, who employed various "extra-literary" devices in his *Commedia*, which has given rise to reams of commentary. For example, this great poem is designed around an elaborate scheme of numerical symbolism, reflecting the number-mysticism of the Middle Ages; this much is acknowledged by all Dante scholars. However, certain analysts wanted to go further, and so, in 1921, Walter Arensberg published a book entitled, "The Cryptography of Dante," in which he purported to extract anagrammatical messages from portions of Dante's text.

Now, no one who knows Dante would dare postulate that he was incapable of using anagrams, and there are probably authenticated instances of their use in the *Commedia*. The problem with Arensberg's approach is that he had Dante using anagrams on a "wholesale" basis, and this is not consistent with the overall nature and purpose of Dante's work.

However, as regards Mallarmé, we have an author who not only published a "manifesto" extolling literary hermeticism (1862), but who explicitly referred to certain of his works as a "game" or a "jest" (*un jeu*). This becomes very clear when we review one of Mallarmé's late prose essays, such as "Mystery in Letters," in which the surface or "exterior" text seems to convey no coherent message (please see the excerpt I have attached). This was one of Mallarmé's ways of signalling that the true meaning of his text could not be derived from an "ordinary" reading of it...hence, we have a case quite different from Dante, or (in fact) from any writer who preceded Mallarmé, in that the incoherence of the surface text is directly proportional to the complexity and "essentiality" of the cryptogrammatic system which underlies it. Whether or not Dante embroidered the *Commedia* with anagrams is completely irrelevant to the main significance of this work, but in the case of Mallarmé, the only consistent meaning we can extract from his "late" writings is contained in their cryptogrammatic infrastructure.

What Mallarmé developed, in effect, was a novel linguistic method for dealing with real-world topics (using ordinary language-components) which bypassed the normal descriptive functions of language in favor of word-games. On the surface, we don't see too many signs that his essays consist of a series of puzzles (one per phrase), because he was so clever at organizing these phrases into a semblance of normal-looking text. But once his methods are understood, and the overall structure and purpose of his cryptosystem is recognized, it then becomes possible to solve the specific puzzles for their historical/topical content...in this way, the ideological stratum underlying Mallarmé's cryptoprose comes to light, and its "hidden message" is recovered.

"Found" Versus "Created" Puzzles. In order to make these texts resemble "ordinary" writing, Mallarmé knew that he would have to include a variety of short, one-word or two-word phrases, which would have to constitute puzzles in their own right, but which he would find rather than create. In other words, he gambled on the possibility that there were a variety of ordinary French words which (according to the "rules" of his system) could be interpreted as puzzles, even though he had had no hand in creating them! This in turn meant that he had to subject a substantial portion of the French language to analytic scrutiny (including anagrammatic analysis) in order to determine its "pre-existing" puzzle-content -- a stupendous task. However, the material unearthed to date indicates that he performed this task successfully, and that Mallarmé's "found" puzzles can be just as challenging and rewarding as those he custom-tailored.

As an example of one of Mallarmé's "found" puzzles, I present herewith an analysis of the common word, maintenant ("now"), which occurs as phrase no. 7 in paragraph 5 of Mystery In Letters. The key to this puzzle resides mainly in its anagrammatic content, and although it contains only ten letters, there are hundreds of ways in which they may meaningfully be rearranged. But once the reshuffling and re-scrambling is completed, a clear picture emerges of a major historical event of the 19th century: The U.S. Civil War.

The key anagram is ANTIETAM, N.N., where "N.N." represents a standard initialism, which was often attached to the blank spaces on a form document that were meant to be filled in with a name or number; the document in this case would most likely be a death or burial certificate. ANTIETAM is a small creek in Maryland which became the site of one of the bloodiest battles of the Civil War, when (on September 15 & 16, 1862, General Lee attempted to invade Union territory, but was repulsed. This provided Lincoln with the political opportunity he was seeking, and on September 22, he issued a decree warning the Confederate States that, unless they ended their rebellion, he would emancipate their slaves on January 1, 1863.

It will be noted that there are two general ways in which the letters of maintenant can be reinterpreted: One is to "space them out" in their original sequence, and the other is to actually rearrange them. Using the first method produces MAIN TENANT, which alludes to the President: i.e., he does not own the White House, but lives there as the "tenant" of the U.S. government during his term of office.

When these two words are read in French, main tenant means "hand-holding," thus suggesting the prototypical cartoon of Lincoln leading the slaves to freedom "by the hand" -- i.e., through an act of manumission (from L. manus = hand). Also, reading these two words as English plus French would yield "main holding" (from tenir = "to hold"), which would allude to the Abolitionist belief that all men are created free and equal. It also suggests that the main wealth of some of the slaveowners was their slaves.

Another mode of "spacing" produces MAIN TEN ANT-, where "ant-" is a well-known prefix meaning "against." Hence, the "ten" would signify the ten Confederate States named in the Emancipation Proclamation. Similarly, we can produce maint en ant- ("many against"), signifying the large scope of this War. When "ant" is used as a word instead of a prefix, it brings forth this puzzle's major analog, which is to compare the Negro slaves with a swarming ant colony; now maint en ant could mean that many significances or parallels reside in this comparison. For example, ants are the most prodigious workers in the insect world, and they are the only creatures, aside from man, who enslave their own kind; army ants go forth to battle other ants, and make the defeated their prisoners. Now it is possible to interpret main t en ant to refer to "trait," or even to traite ("trade"), since la traite is the standard French term for the slave trade.

This leads to the respacing, M AIN'T EN ANT, in which "M" would stand for "mercy" or "manumission." In other words, the ant is capable of enslaving its own kind, but only man (and not all men at that) is capable of emancipating a slave on humanitarian grounds.

Next we turn to the anagrams which result from letter-rearrangement, one of which is MAINT ANENT ("many against"), signifying the large scope of this War. Then we have a MAN INTENT, which of course would pertain to Lincoln, as well as A MAN IN TENT; this refers to the famous photographs of Lincoln, taken by Matthew Brady and others, when he visited the Army of the Potomac in early October 1862. At around this time, there occurred an "opposition of Mars," and as we recall, Lincoln was affectionately referred to as "Marse" ("Master") by the slaves. In French, the term haut position de Mars is pronounced identically with opposition..., etc.

TAN ANT MINE does not require too much explanation, since, dating from antiquity, mines were traditionally worked by slaves; during the Civil War, in addition, colored soldiers were often used as sappers. TAN ANT MEIN would allude to a servile, "Uncle Tom" demeanor. In the construction, MINE TAN ANT, "mine" is an archaic possessive pronoun, just as slavery is an archaic possessive institution. MAN ANTI TEN would obviously be Lincoln, while ANENT A MINT refers to the Confederate seizure, in early 1862, of Union mints and fortresses, which ultimately led to hostilities. I NET TAN MAN refers to a slave-hunter (this scene was graphically portrayed in Roots), while MEAN N.A. TINT refers to the fact that negritude is much more of a social stigma in North America (particularly the U.S. and Canada) than it is in Latin or South America. Then we have TAN INMATE N, which suggests that, in the later 19th century as now, Negroes represented a disproportionate share of the prison population; also, in many respects, slavery was their "prison."

TAN MEN AIN'T (i.e., persons): This would refer to the Dred Scott decision of 1857, which held that the colored slaves were property, not people. It was this property issue which lay at the root of the problem, since the Abolitionists could not figure out a way to recompense the slave-owners for the monetary loss they would suffer if the slaves were freed. In 1860, there were about 4 million colored slaves, with an average value of about \$1,000. Lincoln's Emancipation Proclamation sliced through this problem, since as a wartime edict imposed as punishment on the rebellious States, no compensation was needed. The first section of this document begins with "WHEREAS," and its second or principal part, which contains the injunction proper, begins with "NOW" (maintenant).

"SIDE GAMES." Many of Mallarmé's cryptopuzzles have associated with them some "ancillary" word or phrase, which does not appear in the puzzle itself, but which nonetheless helps to amplify or illuminate it; Mallarmé referred to this phenomenon under the general heading of "side games" (jeux à coté).

In the maintenant puzzle, the ancillary word is fourmillant(e), a French adjective which means "swarming," and is derived from the word for "ant" (fourmi). In the context of the puzzle, it takes on "allusive" significance, since it may be read interpretively as four-mill-ante ("four million before"), which of course would refer to the slaves liberated by Lincoln's decree. This word serves admirably to bind the concept of the four million slaves to that of the "ant," or "tan ant," which crops up repeatedly in the puzzle's anagrammatic infrastructure.

There are, of course, hundreds of other anagrams that might be formed from the same ten letters, and so far we have used mainly one language (English), with a little French. English is quite appropriate, however, since the Civil War was "fought" in English, and since it represents Mallarmé's second language: i.e., he taught it in the French school system, and therefore used it extensively in his cryptogrammatic constructs. Hence, even though our French may be a little rusty, we are nonetheless in an excellent position to tackle Mallarmé's puzzles, simply because of their high English-language content.

Based on our first-hand observation of the puzzle-content residing unexpectedly in maintenant, a number of conclusions may be postulated:

1. Maintenant did not become a good word-puzzle until the events of late 1962 and early 1963 had come to pass; in other words, if not for the famous Battle, "Antietam" would be a word with no historical significance.
2. Although millions of other Frenchmen have used this word casually since 1863, it did not become a puzzle until Mallarmé deliberately used it for this purpose, first by analyzing its hidden potential, and then by incorporating it into his cryptosystem. We do not rule out the possibility that this word might have been employed in some French anagram-game, but doubt that such a game would have ventured into English anagrams, or would have specifically explored the historical possibilities inherent in such recombinations...in other words, this word takes on its special significance only when analyzed within the context of Mallarmé's overall system.

Mallarmé's Theory of the Relationship Between Language and Historical Reality.

- a) It is obvious, from the puzzles which have been analyzed to date, and from some of his own statements, that Mallarmé envisaged an esoteric relationship between language-structures and historical reality, in which language is used not to describe, but to codify or encapsulate entities and events.
- b) In order for such a system to exist, there must be a verbal construct -- that is, a text-segment, capable of esoterically representing virtually every historical event or entity, according to the "rules" of this system.
- c) There must be at least one person (Mallarmé) capable of performing the original encapsulation or codification, and at least one person ("the analyst") capable of deciphering it.
- d) This mode of representation is superior, in certain respects, to ordinary description, since it simulates or analogizes key events of the past, and thus forces the analyst to reconstruct or recreate them. However, it is also much more difficult to understand, since its fundamental concept is that of the enigma.

e) The cryptopuzzle, as well as its component logograms, thus becomes a symbolum, intended to provoke contemplation of the root causes of historical events. For example, we noted above that maintenant could be anagrammed into MAN ANTI TEN, but it can just as easily be rearranged to spell TEN ANTI MAN. In other words, the Southern states organized themselves into a Confederacy immediately following Lincoln's election, and without realistically calculating the consequences of their own actions. Had they remained in the Union, there is little or no chance that Congress would have ever enacted abolitionist legislation, if only because it could not solve the compensation problem. Thus, by acting on an ad hominem basis, simply because it opposed Lincoln's views, the South brought about its own destruction.

f) The Mallarméan cryptopuzzle is an organic entity of great depth and richness, containing many unexpected facets and relationships. Thus, it represents a completely novel verbal/intellectual device, whose full gamut of characteristics is still being explored. It imbues "ordinary" language-constructs with a wide range of potentially symbolic meaning, but is entirely dependent for realization on our own reconstructive efforts. Thus, in effect, when Mallarmé's great "Orphic Book" is finally deciphered, it will be the analysts (i.e., ourselves), just as much as Mallarmé, who will have brought it to fruition. Thus, we have (in effect) a "binary language" -- that is, Mallarmé is the brain, but we are the "mouth," which must paraphrase what the "brain" had in mind.

Is Mallarmé's system understandable? -- That is, can it be reconstructed? Some might say, no, but I say YES, and here are my reasons:

a) I have already solved several of the puzzles, and have documented the system's main outlines; b) The system has revealed itself as both logical and imaginative; c) It focuses on well-known and well-documented historical events; d) Many of its clues are contained in the "fabric" of history itself; e) It uses many word-games with which we are already familiar; f) Its constructs are highly precise, even in a numerical sense; g) It analogizes history by forcing us to repeat or simulate key actions on a logological level; h) It embodies wit and humor.

CONCLUSION. This has turned out to be a rather roundabout way of answering Rick Rosner's timely question. I hope, now, that some other NOESIS readers will come forward with their own examples of "hypertext," or will (alternatively) take a stab at analyzing some of Mallarmé's remaining puzzles -- there are thousands of them.

THE ELECTRON

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We have not yet actually seen an electron. We know of the existence of the electron only from our perceptions of its behavior. We have devised a number of theories as to its physical nature. Those theories portray the electron as either a solid spherical object of unknown internal structure; a "wave" complex of some sort; or a "probability". Most theories assign an electron a unit electric charge, a unit magnetic property, a unit mass, and a "spin".

Many of these concepts have been devised from observations of the electron's behavior. Others have been developed to fit the electron into more comprehensive theories of physics.

Being dissatisfied with the current theories of the fundamentals of physics as too contrived and complex, I attempted to synthesize a new and simple theory of nature based on obvious properties of space, time, and energy which are ignored by today's physics. A new concept of the electron quickly arose from my theory.

The following discussion is a description of the electron which naturally arises from my comprehensive theory of the fundamentals of nature, which I call the Space-Action Theory (SAT). The SAT provides simple explanations of many questions left unanswered by current theoretical physics.

I. The Continuum.

The continuum is my name for the intangible universe. It includes space, time, and energy. The continuum is described by six properties, all of which are impalpable. The metrics (standards of measurement) of these properties may be represented by six inter-related mathematical variables. Three of these variables are x, y, z which form "space". The fourth is duration, or "time", t . The remaining two are the different aspects of "energy" which we perceive as electric (E) and magnetic (M) "intensities". None of the properties of the continuum is directly perceptible; we know they exist only because they underlie our existence and the existence of things that are perceptible to our senses and instruments.

In those volumes of the continuum in which no "particles" are present or nearby, the metrics of x, y, z , and t possess their maximum possible ("maxic") magnitudes, and the metrics of E and M are zero. Such volumes are what conventional physics calls empty space and time.

II. The relationship between Space and Time.

It is a physical fact that all perceptible things have four
NOESIS Number 120 June 1996 page 18

properties: three of space (x,y,z) and one of time (t). If any of the four is zero, then all are zero. There are no 1D lines, 2D planes, or 3D volumes, except in our imaginations.

All perceptible things must have some duration in time. Any thing that has zero time duration does not exist in space or time, but such entities can exist in the continuum.

If the metric of time were to be reduced to zero in some volume of space, then the metrics of x, y, z, would also be reduced to zero. A meter would have zero length and a second would have zero duration.

III. The relationship between Energy and Time.

Energy can and does exist in time-stasis. If the metric of time in some volume of space is zero, the metrics of electric and magnetic energy, E and M, are at their maxic values, but exist only as potentials. Energy can be effective only when the metric of time exceeds zero.

IV. Time is the link between Space and Energy.

The metric of time interacts directly with those of space. The metric of time interacts directly with those of energy. The metrics of energy and those of space interact only via their interactions with time.

V. The creation of an Electron.

I will use "electron" to mean both the negative and positive versions of the only fundamental "particle". They differ only in the mysterious property we perceive as "polarity".

If the metric of time becomes zero in some volume of space, the metrics of space also become zero. Then the metrics of E and M acquire their maxic values. The result is a dimensionless point in space, which is in time-stasis, and possesses unit E and M "charges". Such a point is what we perceive as an electron.

VI. Gravity and Mass.

In the creation of an electron, a volume of space would cease to exist, leaving a void. A void cannot exist, so as the electron comes into existence, the metrics of space in all directions surrounding the electron are stretched toward that dimensionless point. The metrics of all of surrounding space are affected proportionally, to infinite distance from an electron. The metrics of the volume nearest the electron are stretched the most. Since the volume of surrounding space increases with distance from the electron, the amount of stretching of the metrics of space decreases with that distance. The length of a meter decreases with distance from the electron: a meter near an electron is longer than a meter farther from that point.

It is this stretching of the metrics of space toward an electron

that we perceive as a gravitational field. Every electron possesses a unit gravitational field.

The conventional view is that a gravitational field is related to, and is a result of "mass". In my theory, a gravitational field is the result only of the collapse of the metrics of time and space to form an electron, which has no "mass". There is no such thing as "mass".

Gravity is always a stretching of the metrics of space toward an electron. Gravity must, therefore, always be an acceleration toward an electron. Natural reverse gravity is impossible.

VII. Description of an electron.

An electron is a dimensionless point at which the metrics of space and time, x, y, z, t , are all zero. Any such point possesses unit E and M charges and a unit gravitational field. Electrons are the only fundamental "particles", and are immaterial, possessing no "mass".

VIII. Remaining mysteries.

If the foregoing theory is valid, it leaves us with at least two fundamental mysteries to be solved:

- a) Under what conditions can the metric of time become zero in a limited volume of space?
- b) What is the nature of the mysterious properties we perceive as positive and negative electric and magnetic charge?