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MediShare: Arnold Kalan, M.D., WB6OJB
News Editor: Warren Brown, M.D., KD4GUA



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Marco Blogsite: marco-Ltd.blogspot.com
"listserve": <http://googlegroups.com>

Web Site: <http://www.marco-ltd.org>
Internet address: warren.brown1924@gmail.com

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P.O. Box 127, Indian Rocks Beach, FL., 33785-

THE URGE TO RUN THE OTHER WAY—THE P450 SYSTEM

WHEN THE SUBJECT OF THE LIVER'S ENZYME SYSTEM, CALLED THE CYTOCHROME P450 SYSTEM IS DISCUSSED, WE FEEL THE URGE TO LEAVE TOWN.

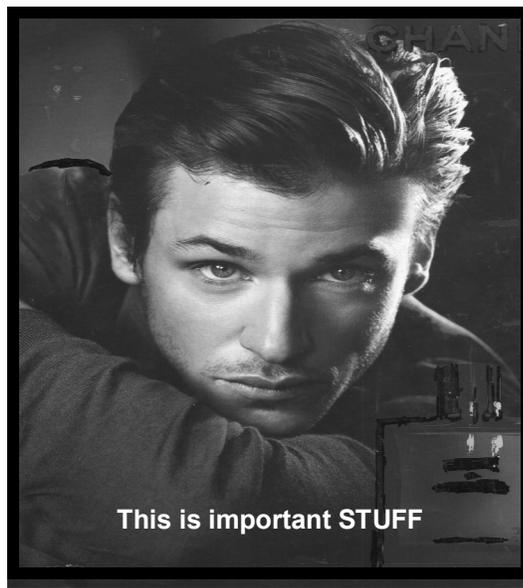
Cytochrome P450 enzymes are essential for the metabolism of many medications. Although this class has more than 50 enzymes, six of them metabolize 90% of drugs, with the two most significant enzymes being CYP3A4 and CYP2D6. Genetic variability (*polymorphism*) in these enzymes may influence a patient's response to commonly prescribed drug classes, including beta blockers and antidepressants. Cytochrome P450 enzymes can be inhibited or induced by drugs, resulting in clinically significant drug-drug inter-actions that can cause unanticipated adverse reactions or therapeutic failures. Interactions with warfarin, antidepressants, anti-epileptic drugs, and statins often involve the cytochrome P450 enzymes. Knowledge of the most important drugs metabolized by the P450 enzymes, as well as the most potent inhibiting and inducing drugs, can help minimize the possibility of adverse drug reactions and interactions. Although genotype tests can determine if a patient has a specific enzyme polymorphism, it has not been determined if routine use of these tests will improve outcomes.

CYP450 enzymes are essential for the production of cholesterol, steroids, prostacyclins, and thromboxane A2. They also are necessary for the detoxification of foreign chemicals and the metabolism of drugs. CYP450 enzymes are so named because they are bound to membranes within a cell (cyto) and contain a heme pigment (chrome and P) that absorbs light at a wavelength of 450 nm when exposed to carbon monoxide. There are more than 50 CYP450 enzymes, but the CYP1A2, CYP2C9, CYP2C19, CYP2D6, CYP3A4, and CYP3a5 enzymes metabolize 90% of drugs. These enzymes are predominantly expressed in the liver, but they also occur in the small intestine, lungs, placenta and kidneys.

Pharmacogenetics: One out of every 15 white or black persons may have an exaggerated response to standard doses of beta blockers (metoprolol, Lopressor), or no response to the analgesic tramadol (Ultram). This is because drug metabolism via CYP450 enzymes exhibits genetic variability (*polymorphism*) that influences a patient's response to a particular drug.

A specific gene encodes each CYP450 enzyme. Every person inherits one genetic allele from each parent. Alleles are referred to as "wild type" or "variant" with wild types occurring most commonly in the general population. An "extensive (i.e., normal)" metabolizer has received two copies of wild type alleles. Polymorphism occurs when a variant allele replaces one or both wild-type alleles. Variant alleles usually encode a CYP450 enzyme that has reduced or no activity. Persons with two copies of variant alleles are "poor" metabolizers, whereas those with one wild-type and one variant allele have reduced enzyme activity. Finally, some persons inherit multiple copies of wild-type alleles, which results in excess enzyme activity. This phenotype is termed an "ultra rapid" metabolizer.

CYP450 enzyme polymorphism is responsible for observed variations in drug response among patients of differing ethnic origins. For example, 7%



This is important STUFF

NEED CATEGORY I CME?

Go to www.mpmcme.org enter; go to "medical surgical archives" and a list will pop up...pick the lecture you want (includes mandatory ones) & when completed take the simple test and submit it to "Lee" for accreditation. When your medical license is up for renewal, notify Lee & she will submit the papers required. Tell her you affiliated with the hospital through MARCO and Dr. Warren Brown.

(Tnx to Morton Plant Hospital, Clearwater, Florida, an associate of the University. of South Florida medical school.)

LATE BREAKING NEWS

The 2017 Annual MARCO meeting will be held at the Hilton Garden Inn in Schaumburg, Illinois close to O'Hare airport in Chicago on April 27 through April 30th. For reservations call Ellie Dailey at 224 520 6951. Plan for an educational meeting after the Friday AM meeting which begins at 8 a.m.

CME Certificates for 2016 are enclosed with this Newsletter. Corrections should be sent to warren.brown1924@gmail.com.

Radio history is continued with the history of car radios on page 3 and the ongoing synopsis of *Empires of the Air*, *The Men Who Made Radio* on page 11.

REMEMBER: An INDUCER results in an increased metabolism of another drug and the effect of the other drug is reduced. An INHIBITOR raises the drug level of the other drug and can have a harmful effect of that drug

WRITE TO US!
 We welcome your comments.
 Mail to Marco, P.O. Box 127,
 Indian Rocks, FL,
 33785. Email to
 warren.brown1924@gmail.com
 Letters may be edited for
 brevity & clarity.

MARCO NET SCHEDULE

<u>DAY</u>	<u>EASTERN</u>	<u>FREQ.</u>	<u>NET CONTROLS</u>
Any Day	On the Hour	14.342	Hailing Frequency
Sunday	10:30 a.m. Eastern	14.140	CW Net, Chip, N5RTF
Sunday	11 a.m. Eastern	14.342	Warren, KD4GUA

(Alternate **confidential** Grand Rounds frequency—
 on or about 14.344 or as announced on the air.)

**MARCO'S CW
 NET IS NOW
 CALLED THE
 "Bob Morgan
 Memorial
 Net"**
 Sundays, 10:30 am,
 14.140 MHz

Page 2

MARCO Grand Rounds is held Sunday at 11 a.m. Eastern Time; 10 a.m. Central; 9 a.m. Mountain, and 8 a.m. Pacific Coast time on 14.342. You qualify for one hour Category II CME credit with your check-in.

of white persons and 2 to 7% of black persons are poor metabolizers of drugs dependent on CYP2D6, which metabolizes many beta blockers, antidepressants and opioids. One in five Asian persons is a poor metabolizer of drugs dependent on CYP2c19, which metabolizes phenytoin (Dilantin), Phenobarbital, omeprazole (Prilosec), and other drugs. Variance in drug response among persons of different ethnic origins also can be caused by genetic variations in other drug-metabolizing enzymes, drug transporters and drug receptors.

KEY RECOMMENDATIONS FOR PRACTICE

Genotype testing may predict persons who are poor metabolizers or are not responsive to drugs metabolized by CYP450.

However, large prospective trials are needed to demonstrate that genotypes testing improves outcomes & is cost effective.

Genetic variations in CYP450 metabolism should be considered when patients exhibit unusual sensitivity or resistance to drug effects at normal doses.

Studies demonstrate a link between adverse effects and variant CYP450 alleles.

Patients should be monitored closely for the development of adverse drug effects or therapeutic failures when a potent CYP450 enzyme inhibitor or inducer is added to drugs metabolized by one of more CYP450 enzymes.

Well recognized causes of clinically significant drug interactions. Severe toxicity can result if CYP450 enzyme inhibiting drugs are added to the following medications: atypical antipsychotic, benzodiazepines, cyclosporine, statins or warfarin.

Particularly true if substrate drug depends on only one CYP450 enzyme for metabolism.

Because they are known to cause clinically significant CYP450 drug interactions, always use caution when adding the following substances to medications that patients are taking: amiodarone (Cordarone), antiepileptic drugs, antidepressants, antitubercular drugs, grapefruit juice, macrolide and ketolide antibiotics, nondihydropine calcium channel blockers, or protease inhibitors.

DRUG INTERACTIONS: Many drug interactions are the result of an alteration of CYP450 metabolism. The non-sedating antihistamines Seldane and Hismanal and the GI. Motility agent Propulsid, were all withdrawn from the U.S. market because metabolic inhibition by other drugs led to life-threatening arrhythmias. The calcium channel blocker Posicor was withdrawn from the U.S. market in 1998 because it was a potent enzyme inhibitor that resulted in toxic levels of other cardiovascular drugs.

Drugs interact with the CYP450 system in several ways. Drugs may be metabolized by only one CYP450 enzyme (e.g., metoprolol by CYP2D6) or by multiple enzymes (e.g., warfarin by CYP1A2, CYP2D6, and CYP3A4) Drugs that cause CYP450 metabolic drug interactions are referred to as either inhibitors or inducers. Inhibitors block the metabolic activity of one or more 450 enzymes. The extent to which an inhibitor affects the metabolism of a drug depends upon factors such as the dose and the ability of the inhibitor to bind to the enzyme. For instance, Zolof is considered a mild inhibitor of CYP2D6 at a dose of 50 gm, but if the dose is increased to 200 mg. it becomes a potent inhibitor. Inhibitory effects usually occur immediately.

Additionally, a drug can be both metabolized by and inhibit the same enzyme (erythromycin), or it can be metabolized by one enzyme and inhibit another enzyme (Lamisil). Drugs may be intentionally combined to take advantage of CYP450 inhibition.

SIGNIFICANT INHIBITORS, INDUCERS & SUBSTRATES

<u>Inhibitors</u>	<u>Inducers</u>	<u>Substrates</u>
Cordaron, Tagamet, Cipro Luvox. Diflucon, Prozac, Flagyl, Norvir Bactrim, Septra Isoniazid, INH Benadryl, Paxil, Lomisol, Biaxin, Cardizem, grape fruit juice Sporanox, Nizoral, ritonavur Ketek, Calan.	Tegretol rifampin tobacco phenobarbital phenyton rifampin St. john's Wort	caffeine, clozaril, theophylline Coreg, Prilosec phenobarbital, phenyton Amitriptyline, codeine, Aricept Haldol, Lopressor, resperidone, Ultram, Xanax Norvasc, Lipitor, Valium, Estrace, Zocor, Viagra, Ambien.

NUGGETS

75% of all drugs go through the P450 System.
CYP is a host of enzymes that use iron to oxidize harmful substances by making them more water soluble. Adding hydroxyl groups is part of the body's strategy to get rid of the "drug." This is followed by conjugation to groups such as glucuronide to increase the solubility even further. Saudi & Ethiopians chew up a variety of drugs making them ineffective, many antidepressants & neuroleptics are examples. Grapefruit juice reacts with statins, antiarrhythmic agents, immunosuppressants, warfarin & calcium channel blockers.

Norvir, a protease inhibitor and potent CYP3A4 inhibitor, is added to lopinavir (Kaletra) to boost serum levels in patient with HIV virus (*Harry WB9EDP brought this to our attention on Grand Rounds, Nov. 11th*).

Inducers increase P450 enzyme activity by increasing enzyme synthesis. Unlike metabolic inhibition, there is usually a delay before enzyme activity increases, depending on the half-life of the inducing drug. A decrease in the concentration of a drug metabolized by CYP2C9 can occur within 24 hours after the initiation of rifampin, an inducer with a short half-life, but can occur up to one week after the initiation of Pheno-barbital, an inducer with a very long half-life. A drug also may be metabolized by the same CYP450 enzyme that it induces (tegretol) a potent enzyme inducer, must be initiated at a low dose and then increased at weekly intervals as its half-life gradually decreases over time.

The following clinical scenario describes a case of drug interaction: A 68-year-old white woman taking warfarin, whose condition was previously well controlled on a stable dose, has recently been difficult to anticoagulate to a therapeutic level. Review of her medications reveals the addition of monthly Diflucon for recurrent vulvo-vaginal candidiasis. The doctor recognizes the drug interaction between warfarin and fluconazole as a potential cause and switches the patient to an alternate antifungal agent. The patients' INR quickly stabilizes.

As shown in this example, physicians should be cautious when prescribing a drug known to be CYP450 inhibitor or inducer. The target drug may need to be substituted or the dose adjusted to account for a potential decrease or increase in metabolism. Information regarding a drug's CYP450 metabolism and its potential for inhibition or induction can be found on the drug label and accessed through the FDA. The FDA has required this information for every drug approved since 1997..

<u>DRUG(S)/PRODUCT</u>	<u>ENZYME INHIBITOR OR INDUCER</u>	<u>DRUG(S)</u>	<u>METABOLIZING ENZYME</u>	<u>POSSIBLE CLINICAL EFFECT</u>
Cordarone	CYP2C9 and CYP3A4 inhibitor	Warfarin	CYP2C9	Increased bleeding
Tegretol, Dilantin	CYP3A4 inducer	Estradiol contraceptives	CYP3A4	Unplanned pregnancy
Biaxin, Ketek	CYP3A4 inhibitor	Zocor, Calan	CYP3A4	Myopathy, Rhabdomyolysis low BP QT prolongation
Cardizem, Verapamil	CYP3A4 inhibitor	Prednisone	CYP3A4	Immunosuppression
Prozac, Paxil	CYP2D6 inhibitor	Risperdal, Ultram	CYP2D6	Increased extrapyramidal, more pain
Grapefruit	CYP3A4 inhibitor	Buspar	CYP3A4	Dizziness
Flagyl	CYP2C9 inhibitor	Warfarin	CYP2C9	Increased bleeding
Lamisil	CYP2D6 inhibitor	Amitriptyline	CYP2D6	Dry mouth, dizziness, & cardiac toxicity.

HISTORY OF THE CAR RADIO

One evening, in 1929, two young men named William Lear and Elmer Wavering drove their girlfriends to a lookout point high above the Mississippi River town of Quincy, Illinois, to watch the sunset.

It was a romantic night to be sure, but one of the women observed that it would be even nicer if they could listen to music in the car.

Lear and Wavering liked the idea. Both men had tinkered with radios (Lear served as a radio operator in the U.S. Navy during WW I) and it wasn't long before they were taking apart a home radio and trying to get it to work in a car. But it wasn't easy: automobiles have ignition switches, generators, spark plugs, and other electrical equipment that generate noisy static interference, making it nearly impossible to listen to the radio when the engine is running.

One by one, Lear and Wavering identified and eliminated each source of electrical interference. When they finally got their radio to work, they took it to a radio convention in Chicago.

There they met Paul Galvin, owner of Galvin Manufacturing Corp. He made a product called a "battery eliminator, a device that allowed battery-powered radios to run on household AC current. But as more homes were wired for electricity, more radio manufacturers made AC-powered radios. Galvin needed a new product to manufacture. When he met Lear and Wavering at the radio convention, he found it. He believed that mass-produced, affordable car radios had the potential to become a huge business.

Lear and Wavering set up shop in Galvin's factory, and when they perfected their first radio, they installed it in his Studebaker. Then Galvin went to a local banker to apply for a loan. Thinking it might sweeten the deal, he had his men install a radio in the banker's Packard. Good idea, but it didn't work—half an hour after the installation the banker's Packard caught fire. They didn't get the loan. Galvin didn't give up. He drove his Studebaker nearly 800 miles to Atlantic City to show off their radio at the 1930 Radio Manufacturers Association convention. Too broke to afford a booth, they parked the car outside the convention hall and cranked up the radio so that passing conventioners could hear it. That idea worked—he got enough orders to put the radio into production.

That first production model was called the 5T71. Galvin decided he needed to come up with something a little catchier. In those days many companies in the phonograph and radio businesses used the suffix "ola" for their names—Radiola, Columbiola and Victrola were three of the biggest. Galvin decided to do the same thing, and since his radio was intended for use in a motor car he decided to call it the Motorola.

But even with the name change, the radio still had problems: When Motorola went on sale in 1930, it cost about \$110 uninstalled, at a time when you could buy a brand-new car for \$650, and the country was sliding into the Great Depression. (By that measure, a radio for a new car would cost about \$3,000 today.) In 1930, it took two men several days to put in a car radio. The dashboard had to be taken apart so that the receiver and a single speaker could be installed, and the ceiling had to be cut open to install the antenna.

These early radios ran on their own batteries, not on the car battery, so holes had to be cut into the floorboard to accommodate them. The installation manual had eight complete diagrams and 28 pages of instructions. Selling complicated car radios that cost 20% of the price of a new car couldn't have been easy in the best of times, let alone during the Depression.

Galvin lost money in 1930 and struggled for a couple of years. But then he picked up in 1933 when Ford began offering Motorola's pre-installed at the factory. In 1934 they got another boost when Galvin struck a deal with F.B. Goodrich tire company to sell and install them in its chain of tire stores. By then the price of the radio, with installation included, had dropped to \$55. the Motorola car radio was off and running. (The name of the company would be changed from Galvin Manufacturing to "Motorola" in 1947.) In the meantime, Galvin continued to develop new uses for car radios.

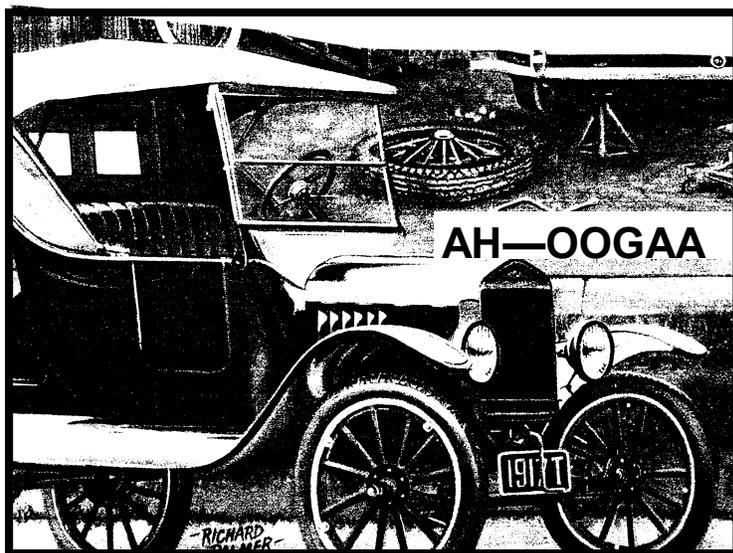
In 1936, the same year that it introduced push-button tuning, it also introduced the Motorola Police Cruiser, a standard car radio that was factory preset to a single frequency to pick up police broadcasts. In 1940 he developed the first handheld two-way radio, The *Handy-Talkie* for the U.S. Army.

3 Point of Care Ultrasound... The new handheld ultrasound streamlines 21st Century health care..price: \$7,500— **now you can throw away your stethoscope!** High field for skin and low field for internal structures. Makes ultrasound more accessible and more affordable by preventing diagnostic hospitalizations.

The unit includes probe and display. The new units are relatively heavy and easy to drop and the technique is hard to learn—takes maybe 6-12 months to get acclimated. However it can prevent hospitalizations.

With it you can actually visualize the heart valves, the pericardial sac—or place it over the gall bladder to rule out stones, to determine liver size and rule out left ventricular dysfunction. In the E.R. use it can rapidly rule out pleural effusions, carotid calcifications etc.

In summary: Already in use in the Los Angeles area...you see what you see, BUT, there are potential barriers: tests for certification, not many experts to learn from, not FDA approved, not insurance covered (yet), still expensive and heavy and it gives radiologists heartburn. Plans in place to get medical students, primary care & E.R. docs involved—It's coming to your area—SOON! Look for it—our E.R. is using it now.



A lot of the communications technologies that we take for granted today were born in Motorola labs in the years that followed WW II.

In 1947 they came out with the first television for under \$200. In 1956 the company introduced the world's first pager; in 1969 came the radio and television equipment that was used to televise Neil Armstrong's first steps on the Moon.

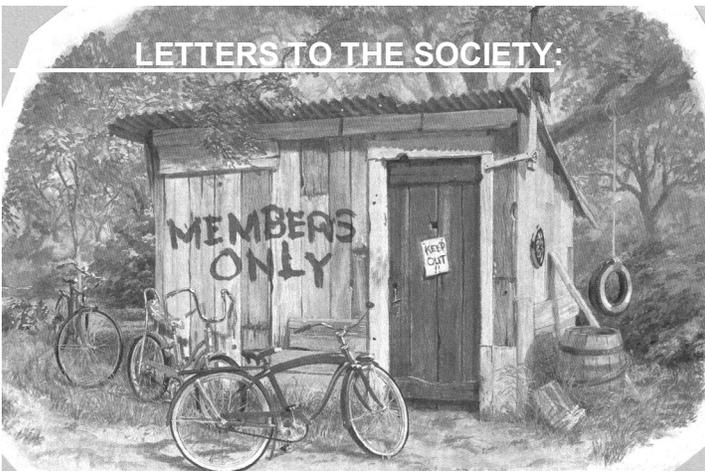
In 1973, it invented the world's first handheld cellular phone. Today Motorola is one of the largest cell phone manufacturers in the world. And it all started with the car radio.

Whatever happened to the two men who installed the first radio in Paul Galvin's car?

Elmer Wavering and William Lear ended up taking very different paths in life. Wavering stayed with Motorola. In the 1950's he helped change the automobile experience again when he developed the first automotive alternator, replacing inefficient and unreliable generators. The invention led to such luxuries as power windows, power seats, and eventually air-conditioning.

Lear also continued inventing. He holds more than 150 patents. Remember eight-track tape players? Lear invented that. But what he's really famous for are his contributions to the field of aviation. He invented radio direction finders for planes, aided in the invention of the autopilot, designed the first fully automatic aircraft landing system, and in 1963 introduced his most famous invention of all, the Lear Jet, the world's first mass-produced, affordable business jet. Not bad for a guy who dropped out of school after the eighth grade.

LETTERS TO THE SOCIETY:



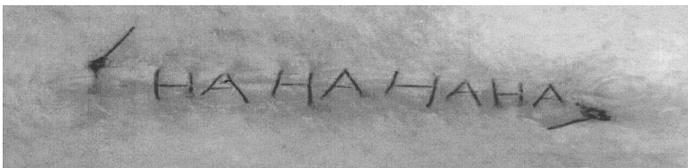
Kudos from (no luck this issue!)

John Benitez, KE3XB, in reference to Grand Rounds discussion on the P450 System: *Wish I could be there. Worked with P450 a lot in medical toxicology for the past 20 years...greetings from Kuwait.* John has been missing from Grand Rounds lately; what are you doing in Kuwait John?

Marco Secretary Joe Breault reports correspondence from **Michalaine Przekop KC9ARP, Batavia, IL., Gonzao Laje AL1W, Potomac, MD** (Ed. Note: *Gonzao went from the frying pan to the fire when he changed his call sign from AA2GL to A11W, where the capital i and l and 1 all look alike!; will try and correct it.*), and **Maury J. Greenberg, M.D., WB2MSB, and Joe Feminella, KA9QAT, New Lenox, IL**

Harold Kosola, Georgia, writes: You can retire to California where you make over \$450,000 and you still can't afford to buy a house. The fastest part of your commute is going down your driveway. You know how to eat an artichoke. When someone asks you how far something is, you tell them how long it will take to get there rather than how many miles away it is. The four seasons are: Fire, Flood, Mud and Drought, OR you can retire to Florida where all purchases include a coupon of some kind and everyone can recommend an excellent cardiologist.

Rich Lochner, K9CIV, Knox, IN...Submits the below suture line who claims it came at an awkward moment when an assistant told the surgeon a good story, like *"We just removed the wrong leg!" We're*



going to make the legal eagles happy!"

MARCO MINUTES: Static electricity was the first kind of electricity to be discovered. The conservation of charge states that electric charge is neither created nor destroyed. The total amount of electric charge in the universe remains constant.

MARCO AD IN QST MAGAZINE

Club/Hamfests/Nets

FRIEND OF BILL W?? 12:30 pm Eastern: HAAM Net Sat 14.290, Sun 14.340 and Mon-Fri 14.316 <http://www.qsl.net/haam/>

MARCO Medical Amateur Radio Council. Professionals enjoying ham radio. Free newsletter & info. WB2MXJ@arrl.net

EDITOR'S NOTE: Walter Winchell began broadcasting in 1933 to an audience of 25 million people. The Winchell style was unmistakable. He talked rapidly at 197 words per minute..the voice was high-pitched and not pleasant to the ear; but it was distinctive. The staccato quality made every item compelling. He claimed he talked so fast because if he talked more slowly people would find out what he was saying...he began his radio program with a series of dots and dashes operating the key himself. Telegraphers throughout the country complained that what Winchell tapped out made no sense. He realized he hadn't the faintest knowledge of Morse code but he refused to have an experienced telegrapher provide the sound effects for him. He wrote like a man honking in a traffic jam.

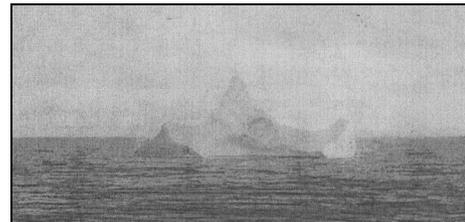


Round-the-world cyclist Thomas Andersen OZ1AA/K9DXX, 33, made it back home to Denmark on Oct. 8th, after a little more than 6 1/2 years of cycling, arriving at the spot where his odyssey began—the City Hall Square in Copenhagen. Begun in 2010, Andersen's *"Cycling the Globe"* adventure covered some 36,000 miles. Andersen said that after his arrival, he went to the local radio club and, using the special event call sign OZ1BIKE, made some 200 contacts with stations all over Europe and America, including some he had visited on his trip.

Mysterious radio signals detected coming from deep space...Scientists have detected six radio bursts from a region in deep space, far beyond our Milky Way, where they had previously uncovered similar signals. The fast radio bursts only lasted milliseconds but can generate as much energy as the Sun in one day. The signals have caused some head scratching and, theories that intelligent beings are trying to communicate with us. In total, 17 bursts have been detected from the same location, including some this past March. The first signals were detected in 2012.

Does neural imprinting relieve pain? Neural imprinting sounds like a term that could be used in a science fiction novel since it has become very popular as a pain reliever. Neural imprinting, using Virtual Reality headsets, has been used since 1996 to help those who were suffering from *chronic pain*, burns, chemo and phantom limb syndrome. This year it has become much easier to use with cheaper headsets being available. It may sound crazy to most people, but in the near future, we could just put on a VR headset and pain would be diluted or gone, the pain stimuli being diluted by concentration on the VR imposing one reality on another. The reason neural imprinting took off is due to not having any negative side effects and the cheaper price of VR headsets. Many still think this is a scam instead of an alternate to help prevent pain addiction. Now, there are estimates that over 80 million of the specialized VR headsets will be sold to hospitals and patients in the near future. Crazy?

No link between vasectomy & prostate cancer risk...A large study from the American Cancer Society adds to the evidence that vasectomy does not meaningfully increase prostate cancer risk.



Titanic iceberg...This photo was taken on April 16, 1912, the day after Titanic sunk. It was shot by the chief steward of the *Prinz Adalbert*. The photo was accompanied by a written statement claiming there was red paint on the side of the iceberg. The infamous iceberg was estimated to be 100' tall and probably originated from a glacier in Greenland and then floated south through the frigid Atlantic waters.

One afternoon in June, a police detective was monitoring a house suspected of illicit activity. A beat-up sedan pulled into the driveway, and three women emerged in a commotion. The policeman walked over to the car and found a man slumped in the passenger seat. The women said he was suffering from a heroin overdose.



The policeman knew the drill all too well. In 2014 in the U.S., 18,893 people died from overdoses related to prescription pain medication, while an additional 10,574 died from heroin. In Ridley Township, a community of 30,000 residents SW of Philadelphia where the above occurred, officials have responded the way many police forces across the country have; arming officers with doses of **naloxone hydrochloride**, a prescription drug, often called the opiate antidote, that can revive a person in the early stages of an overdose.

The policeman stood over the unconscious man and prepared to use **Narcan** nasal spray, which delivers a hefty dose of **naloxone** through a simple-to-use device. He positioned the spray under the man's nostril and pumped once, releasing a fine mist. "Within minutes, he came to," the policeman said. "People will be gurgling on their spit or out cold. You spray it up their nose, and all of a sudden they are like, 'What happened?'"

In recent years, as drug overdoses have overtaken car accidents as the leading cause of accidental death in the U.S., sales of **naloxone** products have soared, from \$21 million in 2011 to \$82 million in 2015. Within this market Adapt Pharma's **Narcan nasal spray** is the fastest growing product. Part of its appeal is that, in theory, anybody can use it to save a life. You don't need to be a doctor or have any medical training. Recently, cooks at a pizzeria in Cincinnati, in between making pies, used it to save two people overdosing in the parking lot. Police officers in Ridley Township now keep a two-pack of the spray stashed in every patrol car.

Back in Ridley Township, detectives say the hardest thing about using **Narcan** is dealing with the anti-naloxone backlash in some heroin ravaged communities. "You hear so many times 'Why are you saving these people?' They are just junkies!"

(Information for the above was taken from Felix Gillette's fine article which appeared in Bloomberg, Nov. 14, 2016)

THE CUTTING EDGE

Below was taken from Matthew Shaer's article which appeared in "Smithsonian, 12/'16.

In Winston Salem, NC, there sits a machine that is, in many ways similar to a standard issue desktop printer. The 800 lb device is unlike anything previous encountered, because what it prints is alive—millions of living human cells contained in a viscous gel and woven through with delicate biodegradable supports in a simulacrum of human tissue.

This is the ITOP (*Integrated Tissue and Organ Printing System*), with its essential breakthrough technologies. Unique reservoirs keep human cells alive for long times and extremely precise needles, or jets, print a latticework of "micro channels," into the biomaterial. These vessels allow nutrient to flow through the tissue

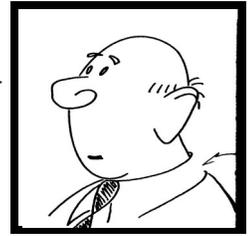
If and when the machine such as the ITOP goes into commercial production, it might be possible to "order" a piece of replacement skin and complex organs such as kidneys and bladders. Organ shortages would become a thing of the past.

Chief in charge, is Peruvian-born 59-year-old Dr. Anthony Atala, director of the Wake Forest Institute for Regenerative medicine who has spent the past decade attempting to print living organs.

In 1999, in a landmark experiment, Atala and a team built replacement bladders for seven children with a severe form of spina bifida. Seven years after the first of the custom-made bladders were implanted into patients, Atala announced that all seven patients were in good health. It was the first time lab-cultivated organs had been successfully used as replacements for their ailing biological counterparts.

Atala was pleased, but he knew that building organs by hand involved too much time and what was really needed was a bit of Ford-style automation. In 2004 Atala agreed to spearhead such an initiative at Wake Forrest for the development of the ITOP. A bright future awaits medicine.

Although current meds cannot cure Alzheimer's or stop it from progressing, they may help lessen symptoms, such as memory loss and confusion, for a limited time.



The FDA has approved two types of medications—cholinesterase inhibitors (**Aricept**, **Exeton**, **Razadyne**) and memantine (**Namenda**) to treat the cognitive symptoms (memory loss, confusion, and problems with thinking and reasoning) of Alzheimer's.

As Alzheimer's progresses, brain cells die and connections among cells are lost, causing cognitive symptoms to worsen. While current meds cannot stop the damage to brain cells, they may help lessen or stabilize symptoms for a limited time by affecting certain chemicals involved in carrying messages among the brain's nerve cells. Sometimes both types of medications are prescribed together. Some physicians also prescribe high doses of vitamin E for cognitive changes.

Cholinesterase inhibitors prevent the breakdown of acetylcholine, a chemical messenger important for learning and memory in early to moderate stages of Alzheimer's. This supports communication among nerve cells by keeping acetylcholine levels high. This delays worsening of symptoms for 6 to 12 months, on average, for about 50% of the people who take them. They are generally well tolerated. Side effects are nausea, vomiting, loss of appetite and diarrhea.

Before beginning a new med, made sure your doctor is aware of all medications currently being taken (*including over-the-counter and alternative preparations*). This is to make certain medications will not interact with one another, causing side effects.

The second type of medication, memantine (**Namenda**) is approved for treatment of moderate to severe Alzheimer's. It can be added to the cholinesterase inhibitor.

Memantine regulates the activity of glutamate, a different messenger chemical involved in learning and memory. It delays worsening of symptoms for some but can cause side effects such as headache, constipation, confusion and dizziness.

Donepezil (Aricept) is the only cholinesterase inhibitor approved to treat all stages of Alzheimer's.

Remember, that regular exercise and brain games increases circulation to the brain helping to prevent Alzheimer's from appearing.

MENTAL TEST BEFORE SURGERY

The late academic surgeon Phil Thorek once said, "If I am going to have surgery there are three things I fear: 1. The blood transfusion. 2. The anesthesia, and last of all the surgery itself." Now hospitals are tending to evaluate patients for memory and thinking problems; the trauma of an operation can worsen cognitive decline.

Anesthesia may put valuable neurons to sleep—forever! Small thrombi may form and break loose resulting in mini-strokes. Blood incompatibilities may arise. Toxic drug reactions may occur.

Studies show as many as 81% of patients who meet the criteria for dementia have never had a formal diagnosis, and families may overlook symptoms as just natural age-related memory loss. Patients with dementia are at higher risk for a complication known as postoperative delirium and are more likely to have worse surgical outcomes, longer hospital stays, functional declines and death.

Without a formal cognitive assessment, "we are consenting all these people for major operations they may not understand and they may not be able to deal with what happens afterwards." Mental tests are coming to your town soon. Look for it.

KEEP MARCO PERKING !
Pass this copy to a friend OR send us a \$15 membership

If you are considering a new, or different microphone for your transceiver, an understanding of the popular available types may help you make a better choice. A big consideration is the element contained within the mic. The two most popular elements are dynamic and condenser electret.

The dynamic type is used more universally than the electrets. Dynamic microphones are generally better matched for popular transceivers like Yaesu, Kenwood, Elecraft, TenTec, Alinco, etc...Icom radios are an exception to the rule as they are designed to use condenser electret microphones.



Dynamic microphones produce a small amount of varying audio current that travels through the mic cable to the transceiver without requiring additional operating voltage or amplification until it reaches the radio input. One important basic electronic fact to keep in mind while reading this article is to understand that audio voltage, similar to AC, will pass through a fixed capacitor, but DC voltage will not. The exception is an electrolytic capacitor which will pass DC in one direction only.

Unlike their dynamic counterparts, condenser electret microphones do not generate audio current. A bias voltage, usually +/-8 volts DC, is fed to the mic element. The diaphragm vibrates to produce a varying voltage in the form of audio frequency current from the voltage supplied to it. The output from the condenser element travels through the cable, then amplified by the mic amp in the radio. Icom radios have a +8 volts on pin 1 of the mic receptacle for the specific purpose of powering condenser microphone elements. Pin 7 is the mic element ground, completing the circuit to allow current to flow from the radio, through the mic element and back to mic amp in the transceiver. This arrangement gives more audio power to override any stray RF on the cable. This helps to prevent audio distortion as opposed to the lower audio power produced by the dynamic microphone element that is more susceptible to RF interference.

The desk microphones manufactured by Icom incorporate an amplifier in the base to help boost audio and to add more control such as volume and tone. They are similar to power mics that are used by some CB radio operators. These amplifiers in the base are powered by a separate 8 volt source supplied by pin 2 on the microphone receptacle. Icom hand mics do not have this feature.

Based on this information, the logical basis for microphone choice would be to use dynamic microphones on transceivers designed to accept them, and to use condenser mics on radios designed for them. Needless to say, this is not always the preferred choice. Many operators choose to use a dynamic mic on a rig that is designed to use a condenser mic. If a dynamic mic is designed by the microphone manufacturer specifically for Icom transceivers it will have a blocking capacitor in line with the element. The blocking capacitor will prevent the DC voltage supplied by the transceiver from reaching the diaphragm of the mic. If the voltage is not blocked, it could freeze up the diaphragm and prevent it from sufficiently vibrating enough to produce the small varying audio current, or at least interfere with it. A capacitor, other than an electrolytic, will allow the audio current to flow while blocking the DC voltage from the rig. This blocking capacitor also prevents damage to the mic amp voltage regulator in the radio.

Any dynamic microphone that is designed by a reputable manufacturer such as Heil, and made specifically for Icom, or other transceivers designed to operate with condenser electret mics will not require modification because they will contain the blocking capacitor or device within the microphone. Those dynamics not necessarily specified for use with these transceivers should be modified with a blocking capacitor in series with the diaphragm and mic receptacle pin. Icom's latest desk mic, the model SM-50, is actually a dynamic microphone. I suspect that Icom added this dynamic to their line of mics because they realized that in recent years the dynamic microphone is gaining popularity and use on their radios.

For those wishing to use a condenser electret microphone on radios designed to use dynamic mics, approximately 5 volts, but not over 8 volts DC will have to be supplied to it from an external supply. Some transceivers other than Icom have 8 volts available at the microphone receptacle, but the pin outs are not configured to supply voltage to the mic element. The pins in the receptacles for the mic element on these radios do not supply the voltage required for a condenser element. This voltage was meant to operate features

in the base of the microphone such as volume and tone, but not to power the element. The mic amp in these radios are designed to give a little more gain for the dynamic microphones than those designed for electret mics because, even though dynamic microphones produce an audio current on their own, it does not equal the current produced by the additional voltage supplied for the condenser mic as does the Icom rigs.

The microphone cable will have to be wired in such a way to route the voltage from the mic receptacle on the radio to the mic element. To reduce the voltage, a resistor should be placed in series. A good value to experiment with should be a 10K resistor. Higher and lower values can be tried for best results. To prevent damage to the mic amp in the radio, an electrolytic capacitor should also be added in the above mention series circuit to allow current to only flow in the direction of the element and not back into the mic receptacle pin designated as the positive side of the microphone connection. This is done by reversing the polarity of the capacitor to oppose the direction of flow of the DC voltage going into the mic amp. This blocks the DC voltage and allows the varying audio voltage produced by the fluctuations of the microphone diaphragm to pass. A 5 mfd electrolytic is a good choice to experiment with. Different values of capacitors and resistors may be considered to adjust tonal quality if needed.

Remember that audio is created by varying the solid DC resulting in a current similar to AC. The audio current should be allowed to flow though the circuit and the DC current should be blocked. This is the case whether you convert a condenser electret mic to be used on a transceiver designed for dynamic mic, or converting a dynamic mic to be used with a radio designed to use a condenser mic.

Obviously, the conversion to make an electret microphone work on radios designed for dynamics is more complicated, but recent trends seem to be more in favor for conversions for dynamic microphones to be used on transceivers designed for condenser electret mics.

This was not meant to be a how-to-article with step by step instructions on making conversions. It is provided to give an understanding of the mechanics involved when considering the use of microphones other than those specified by the manufacturers of transceivers. Sometimes it is possible to plug and play, and sometimes modifications and conversions need to be made for better compatibility.

ANNUAL TREASURER'S REPORT

Bobbie Williams W1BEW, Maryville, TN., Treasurer

Members: Due to the generosity of our membership and a windfall of selling our domain name (*through the efforts of Jay Garlitz*) the **MediShare** account has ballooned.

Our membes dues are coming in on a regular basis. A special thins to Joe Breault, Secretary, and Mary Favaro, former Treasurer for their ongoing assistance.

Master Account.....\$8,335.76
MediShare Account.....\$24,975.18

Respectfully submitted,
Bobbie Williams, W1BEW
Treasurer MARCO

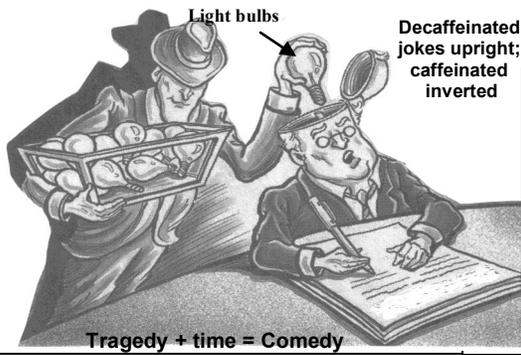


This is the year-end treasurer's report.

HOW THE WHITE HOUSE GOT ITS NAME

During the War of 1812 the British stormed Washington D.C., and set fire to the American President's quarters. Thanks to a heavy rain storm, the fire was extinguished but the building was badly damaged and covered with black soot. In an effort to make the building presentable in a hurry it was covered with white wash and since, the President's home has been called the "White House."

LIGHTEN UP...



I'm not fat....I'm just easier to see!

People say circumcision does NOT hurt. I was circumcised when I was born and I couldn't walk for nearly a year!

I just read that 4,153,237 people got married last year. Not to cause any trouble but shouldn't that be an even number?

I hate when I am about to hug someone really sexy and my face hits the mirror.

Money talks....but all mine ever says is "good-bye."

Relationships are a lot like algebra. Have you ever looked at your X and wondered Y?

SAVING MONEY...Two women are running a ranch in Louisiana and they decide they need a bull. One woman takes their life savings of \$600 and goes to Texas where she meets a cowboy who will sell her a bull for \$599. She buys the bull and goes to the telegraph office to send a wire to her partner. "Have found the bull bring the trailer." When the telegraph operator tells her the price is .75/word, she replies, "Send one word—COMFORTABLE." The operator asks, "But how is your friend going to understand the telegram?" The lady replies, "My friend is blonde and reads REAL slow, when she gets this, she will see "COM-FOR-DA-BULL."

IRISH HUMOR>>>O'Reilly was on trial for armed robbery. The jury foreman came out and announced, "Not Guilty!" "That's great!" shouted O'Reilly. "Does that mean I can keep the money?"

Irish Lass: "Could I be trying on that dress in the window?"
Shopkeeper: "I'd prefer that you use the dressing room."

A WOMAN WENT TO SEE A PSYCHIATRIST. The doctor showed her an inkblot and asked, "What does this mean to you?"
"It means to me," she replied, "that you need a new pen."

John is lying in a hospital bed wearing an oxygen mask over his mouth and nose. A student nurse appears and gives him a sponge bath. "Nurse," he mumbles from behind the mask, "are my testicles black?" "Nurse," she replies, "I don't know, sir, I'm only here to wash your upper body. Through his mask, John struggles to ask again, "Nurse, please check for me, are my testicles black?" Concerned that he might elevate his blood pressure from worrying, the nurse overcomes her embarrassment and pulls back the covers. She raises his gown, she looks at his manhood in one hand and his testicles in the other. The looks very closely and says, "There's nothing wrong with them, sir. They look fine." The man slowly pulls off his oxygen mask, smiles at her, and says very slowly, "Thank you very much that was wonderful...Now listen very closely: Are-my-test—results—back?"

The very first thing I can remember is that I went to the picnic with my father and came home with my mother.

"I don't smoke, drink alcohol or run around with wild women. I have but one vice. "I LIE."

SICKENING...Mark Anthony: "I want to see Cleopatra." Servant: "She's in bed with laryngitis." Mark: "Damn those Greeks."

MARCO OFFICERS, 2016-2017

President: Richard Lochner, M.D. K9CIV
1615 N. U.S. Hwy 35, Knox, IN 46534
Phone 574 772 4115; email: drlochner@gmail.com

President-Elect: Jay Garlitz, D.M.D., AA4FL
P.O. Box 10, Hawthorne, FL., 32640
Phone 352 481 2677; email: jgarlitz@ufl.edu

Secretary: Joseph Breault, M.D., WB2MXJ
1615 Brockenbraugh St., Metairie, LA., 70005
Phone: 504 259 1191; email: wb2mxj@arri.net

Treasurer: Bobbie Williams, W1BEW
2703 Chantay Dr., Maryville, TN., 37803
Phone: 865 983 0055; bobbie@usit.net
E-mail: BruceSmall73@gmail.com

Web Master: Dave Lieberman, KT8E
4424 Technology Dr.
Fremont, CA 94538,
E-mail: Dlieberman@computer-methods.com

Radio-Internet Coordinator:
T. "Chip" Keister, M.D., N5RTF
1000 Jefferson Ave.,
New Orleans, LA. 70115, phone: 504 899 3486
E-mail: tkeister@bellsouth.net

MediShare Director:
Arnold Kalan, M.D., WB6OJB
16690 Charmel Lane,
Pacific Palisades, CA 90272,
E-mail: wb6ojb@yahoo.com
Phone: 310 459 2495

Newsletter Office:
Warren J. Brown, M.D., KD4GUA
P.O. Box 127, Phone 727 542 4158 (cell) 727 595 2773 (home)
Indian Rocks Beach, FL., 33785
E-mail: warren.brown1924@gmail.com

REGIONAL DIRECTORS:

Robert A. Nevins, M.D., KF1J (1st) robert.nevins@gmail.com
Phone: 203 259 8923.

Bruce Small, M.D.,KM2L (2nd), Phone 716 713 5597 cell
BruceSmall73@gmail.com

Keith Adams, M.D., N3IM (3rd) docadams@hughes.net
Phone: 570 295 0629 cell; 570 748 5118 home

Mary Favaro, M.D., AE4BX, (4th) , Phone: 843 267 6879
Email: maryfav@aol.com

Tom Reilly, M.D. W3GAT (5th), w3gat@nwlagardner.org.
Phone: 318 222 8187.

Paul Lukas N6DMV (6th), dmvpalko@yahoo.com; 310 370 9914

Albert Breland, M.D., KA7LOT (7th), Phone: 858 793 6887

Roger M. Higley, D.D.S., W8CRK(8) rhigley599@aolcom
Phones: 513 451 1096, 513 481 5885

Bill T. Hargadon, WA9HIR (9th), Phone: 708 341 2338

Frederic M. Simowitz, M.D., K0FS (0) Fredsimo@aolcom,
Phone:314 725 5112

DIRECTORS AT LARGE:

Harry Przekop, PA-C WB9EDP, hprzekop@aol.com; 312 829 8201

Arnold Kalan, M.D., WB6OJB wb6ojb@yahoo.com

Linda Krasowski, R.N.,KE5BQK. bkrasowski@elp.rr, 915 857 5933

Danny Centers, W4DAN

Jeff Wolf, M.D., K6JW, k6jw@arri.net, 310 373 5970

Joan a beautiful young woman planned to spend most of her vacation sunbathing. She found an ideal spot on the roof of a hotel. It was both deserted and secluded. She wore a bathing suit on the 1st day but then decided to take the untanned portion on the 2nd day, On the second day she was startled by a man running up the stairs to the roof. "Excuse me, Miss," said the flustered manager of the hotel. "The Hotel doesn't mind you sunbathing up here but we would very much appreciate your wearing a bathing suit "Why have you been watching me?" "No, except for the fact that you've been lying on the dining room skylight...."



Fifteen years ago in Marco

February 2002...Lead story “*The Genius who Lit the World,*” the story of Nikola Tesla. **Dr. Robin Staebler** WE1MD was our President. **Bobby Marek** KM5VU, Brenham, TX was conducting a school project with his 9th grade daughter Sarah about the effects of caffeine on one’s blood pressure. Bobby was asking for data from 70 to 100 people and he would let us know the effects. *What happened Bobby, we never did get the results?*

In Cleveland, TN., **Danny Centers** W4DAN, had just purchased a new Buick Century. Danny attended his first Marco Dayton meeting in Spring 2001.

Sun Juli BG2CM, Harbin, China writes, “There are two parts in a Chinese parson’s name. The first part is FAMILY name and the second GIVEN NAME. Take note that the sequence of the whole name of a Chinese person is just different (opposite) from that of an American. When I contact Western friends, I often use Jili Sun (reversed) just like the American usage.

Ten years ago in Marco

February 2007...Lead story if “*Doctor, Why Am I Dizzy?*” Plans were underway for the upcoming meeting in Santa Monica, CA. Under the guidance of President **Arnold Kalan**. An article in JAMA by Mike Mitka titled “Ham Radio Gives Physicians Long Reach” quotes one of our past presidents, **Chipper Keister** N5RTF who states, “*Ham is something you can’t duplicate over the Internet. It’s your own equipment assembled by yourself giving you the ability to communicate freely over the air. It gives you a sense of accomplishment*” The article relatively brief, will at least expose us to other Ham doctors who didn’t know Marco existed.

Five years ago in Marco

February 2012...Lead story is “*The Source of Embarrassing Moments—GAS!*” Top story was **Jim Patterson** W8LJZ, Detroit’s article on his picking up the long lost version of the Air Force One recordings made in the immediate aftermath of President Kennedy’s assassination, Jim writes: “*I feel somewhat vindicated after 48 years as I know what “I heard on their supposed secret scrambled frequency.” It was just single sideband transmissions from Air Force One, a newer technology then, but hams could unscramble it as I did if they knew the frequency.*” A photo of Jim’s log book which contained information heard on his ham radio in 1962-63 was pictured.

Robert “Smitty” Smithwick W8CS’s column featured startling headlines “*Health Scare of the Month—how chairs cause cancer.*” “Research supports a 14-year study that found that six hours of sitting a day increased a woman’s odds of dying in that period by 37% and a man’s by 18% compared with people who sat for half that time.” Smitty also wrote that Muammar al-Qaddafi was addicted to Viagra. Qaddafi’s personal manservant, *Faisal*, said the late Libyan dictator felt a need to have sex with as many as 5 women every day.

MEDISHARE REPORT

Arnold Kalan, M.D., Director

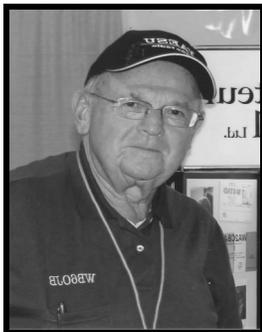
MediShare was formulated some 20 years ago by MARCO to help the less fortunate, especially those in the third-world countries. Over the years we have aided many around the world.

Talk to Arnold WB6OJB, today, and ask about “MediShare” and he will report “*A few good deposits this month with acknowledgements sent out to our friends who donated.*”

The problem is no one can hear the people crying for help.

WHY? Because almost ALL people want help regardless of need.

If you know of a worthwhile humanitarian project give Arnold a buzz at 310 459 2495.



BOB CURRIER MARCO GRAND ROUNDS OF

THE AIR. (Corrections to Marco)

14.342, Sundays, 11 am Eastern, One Hour Cat. II CME

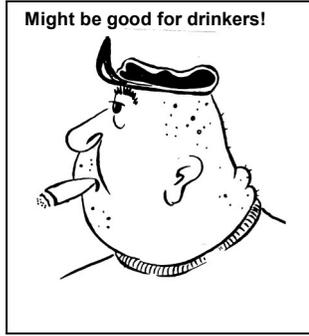
CALL	HRS.	NAME	QTH
KD4GUA	46	Warren	Largo, FL
KC9CS	44	Bill	Seminole, FL
N9RIV	44	Bill	Danville, IL
NU4DO	43	Norm	Largo, FL
N2JBA	41	Ed	Amenia, NY
KNOS	41	Dave	Virginia
N4TSC	40	Jerry	Boca Raton, FL
WB6OJB	38	Arnold	Pac. Pal., CA
N6DMV	38	Paul	Torrance, CA
N5AN	38	Bud	Lafayette, LA
WB1FFI	36	Barry	Syracuse, NY
KM2L	36	Bruce	Clarence, NY
N5RTF	36	Chip	New Orleans, LA
K9CIV	36	Rich	Knox, IN
W1BEW	36	Bobbie	Maryville, TN
KK1Y	34	Art	Seminole, FL
W6NYJ	34	Art	Beverly Hills, CA
W8LJZ	33	Jim	Detroit, MI
K6JW	32	Jeff	Palos Verde, CA
KE5SZA	32	John	Marietta, OK
N4MKT	32	Larry	The Villages, FL
WB9EDP	32	Harry	Batavia, IL
WB2MXJ	31	Joe	St. Metairie, LA
KE8GA	31	George	N. Carolina
KD5QHV	30	Bernie	El Paso, TX
K9YZM	30	Mike	Crystal Lake, IL
N2OJD	29	Mark	Sidney, Ohio
W4DAN	29	Danny	Cleveland, TN
K3iK	27	Ian	Shavertown, PA
A1iN	27	Gonzo	Maryland
N0ARN	27	Carl	Colorado
WA1HGY	27	Ted	Massachusetts
WA1EXE	25	Mark	Cape Cod, Mass.
W3PAT	23	Marvin	Prosperity, SC
N4DOV	22	David	Ft. Lauderdale, FL
N9GOC	22	Pat	Champagne, IL
WA3QWA	21	Mark	Chesapeake, VA
N8CL	21	Chuck	Albany, NY
W0UNZ	20	Paul	Warsaw, MO
K0FS	20	Fred	St. Louis, MO
KB5BQK	17	Linda	El Paso, TX
W1WDR	16	Wayne	Parish, FL
N9HIR	16	Bill	Berwyn, IL
W0RPH	16	Tom	Colorado
K4RLC	14	Bob	Raleigh, NC
W1RDJ	14	Doug	Cape Cod., Mass.
WB8EYE	11	Darryl	New Phila., Ohio
AE4BX	9	Mary	Myrtle Beach, SC
K4JWA	8	Jim	W. Virginia
KD8IPW	8	Mary	W. Virginia
W4TX	5	Elbert	Mississippi.

YEAR TOTAL CHECK-INS AVERAGE PER SUNDAY

1998	694	14.46
1999	766	15.95
2000	1,035	20.29
2001	1153	22.60
2002	1383	26.15
2003	1489	28.63
2004	1534	29.50
2005	1517	29.17
2006	1531 (one extra Sunday)	28.89
2007	1591 (one extra Sunday)	30.02
2008	1524 (Only 46 nets)	33.14
2009	1533 (46 nets)	33.32
2010	1591 (44 nets)	36.22
2011	1514 (44 nets)	34.41
2012	1602 (44 nets)	36.41
2013*	1400 (44 nets) (New Freq)	31.82 (Year of Terrorist)
2014	1756 (47 nets)	37.36
2015	1722 (49 nets)	35.14
2016	1687 (46 nets)	36.67

Record number of stations checked-in was 51, on Feb. 24, 2013

Essential tremor, the most common movement disorder, affects 7 million Americans, most of them elderly. New devices such as high-tech eating utensils can compensate for the tremor to some degree, but real solutions have eluded us. Drug treatments often stop working eventually. Conventional brain surgery can help, but it involves drilling a hole in the skull.



But there's hopeful news. A new, far less invasive surgery, using a procedure called **focused ultrasound**, minimizes the risk of hemorrhage and infection and has been working in many cases.

Essential tremor shows itself as an uncontrollable shaking, usually of both hand and arms, and it gets worse with intentional movement. The rhythm tends to be slow and the amplitude large. Without any specific tests, the diagnosis is what doctors call a "rule-out — given after other maladies have been ruled out.

The big problem for those trying to treat essential tremor is that nobody knows its cause. "**Essential**" is one of the terms that doctors use instead of saying, "*We don't know what makes this happen.*" Scientists can only direct treatments at the symptoms.

In this illness, the important medications include propranolol (also used to treat blood pressure and heart problems) and primidone (an anti-seizure barbiturate). They reduce tremors by 60% in half the patients but have significant side effects.

Traditional surgery for the problem involves inserting a wire through a drilled hole in the skull. It's been known for some decades that the thalamus, a kind of relay center for the brain, is part of the neural circuit underlying essential tremor. The tip of the wire reaches a spot in the thalamus deep in the brain. The area can be destroyed, interrupting the tremor circuit, or stimulated strongly enough to disrupt it. The patient controls this "**deep brain stimulation**" with a remote. When it's turned off, the tremor returns. The advantage of this procedure is that if it affects the wrong part of the brain, it is reversible—no part of the brain had been damaged.

By now we know ultrasound's ability to show our gallstones or our unborn child. Focused ultrasound is not meant to reveal things deep within the body but to alter them. Think of using a magnifying glass on a sunny day to burn a hole in paper: Only the focal point is on fire. Similarly, an acoustic lens can focus many beams of ultrasound on a target—in this case, destroying it.

In the new focused-ultrasound study, doctors took 76 patients (with an average age of 71) with moderate to severe hand tremors. Using focused ultrasound, the researchers destroyed a spot in the thalamus for 56 participants. The other 20 received a placebo procedure at first and the ultrasound later.

Among the first 56 patterns, the procedure improved overall tremor scores by almost 50%, while the placebo group improved not at all—until they too got the ultrasound. The patients initially improved 60% or more in eating, drinking, hygiene, dressing and working, and almost that much in writing. Participation in social activities improved over 70%—important because sufferers are often too embarrassed to play games or socialize outside their homes.

The improvements reversed to a degree the next year, but patients remained much better than before. So the success, while real, was limited and longer follow-up is needed. There is still an argument for deep brain stimulation—skull hole and all—because it won't cause permanent damage. These are still early days for focused ultrasound, but some lucky patients are already finding that life is shaking them up a little less.

(Information for the above was taken from Melvin Konner's fine article that appeared in the Nov. 18th edition of the Wall Street Journal.)



I think I have learned my lesson. Warren always asks about the weather here. Well today as I write this we are having weather. And I am confident that by the time you read this there will be weather that day, too.

The past week Marcia went in for a 2-hour surgery. Quite a bit different from when I trained and scrubbed. I was allowed to experience this from the patients' point of view. I am afraid I wasn't very good. I was on pins and needles until she got back to the room. My bedside manner was very anxious. Anyway, she came through the surgery very well and is doing fine. She is a great patient and does everything her doctor says, but that is not me.

It gave me an opportunity to observe health professionals doing what I do. They were great. They had time to explain and answer questions even those of a medical professional in a different specialty.

This made me think of my own bedside manner. Of course, I am great. Until that is, someone suggests I should treat them like their former doctor did. Then I get into trouble.

A fellow this week came in getting 40 mg. of Oxycodone 5 times per day and Lorezapam 2 mg., 3-4 time a day. I guess I should be grateful, he didn't want Soma, also. As I was informed—if I were a "good" doctor I would just continue on with the therapy regimen from a doctor I do not know with a patient I do not know. Eventually I got an X-ray later in the day. I knew he needed something until I could get him to pain management. I don't manage these kinds of medications. Being middle management I was in a squeeze. We all must meet numbers to survive but at what cost? Indian is getting very tough on these drugs.

Saying "no" is not a bedside manner but making it sound like milk and honey can be. I celebrate your success while I have feet of clay endeavoring to practice good medication. And from this side of the bed I say "Thank You."



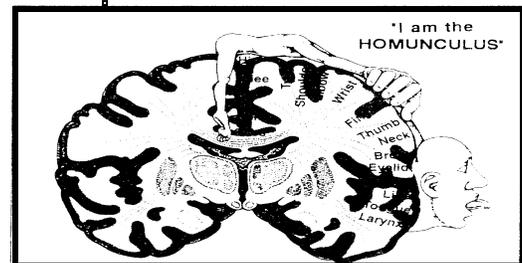
YES...THIS IS HOW IT WORKS...

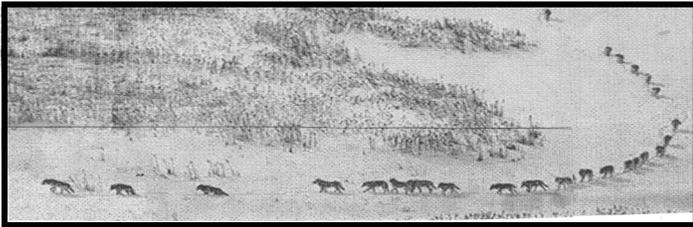
When we bang an elbow we grab it and hold it tight and the pain begins to subside: when a baby falls and cries this mother holds it tight and it stops crying. WHY?

The Chinese experienced the above and found that by pressing on painful areas with spoons the pain subsided. This was the beginning of masseurs and massage therapy. They also found that using smaller and smaller spoons the better the results obtained until finally they settle on the smallest spoon, the needle.

Researchers in the 1960s found that when the brain was exposed in humans and an area of the body was needled there was a secretion of internal morphine (called endorphins) emitted and the pain subsided. This area, known as the homunculus, located in area 4, serves to represent the somatic cortical area of the body. When an endorphin neutralizer (Naloxone) was infiltrated in the damaged area of the brain, the pain resumed.

Injury causes secretion of endorphins in the representative area of the brain causing pain to subside.





The first 3 are the **old** or sick, they give the direction and pace of the pack. If it was the other way round, they would be left behind, losing contact with the pack. In case of an ambush they would be sacrificed.

Then come 5 strong ones, the front line; In the center are the rest of the pack members.. .then the 5 strongest following. Last is alone—the Alpha male...he controls everything from the rear. In that position he can see everything & decide the direction of the pack.

The pack moves according to the elders' pace and help each other watch each other....one is left speechless by nature.... We know that wolves are different but how much we could learn from them.

One doesn't know wolves put the elders of the pack **FIRST**....a lot of people should take note...they are to be seen up front, setting the pace and direction while enjoying the protection of the rest. and not invisible at the back of the line.

THE YEAR'S (2016) TOP HEALTH STORIES

The frightening spread of the Zika virus through the Americas. Outrage over soaring EpiPen prices. And more deaths in the U.S. from addictive opioid painkillers. These are among the big health stories in the past year.

Number 1, Zika virus: The mosquito-borne virus exploded in Brazil, where it was found to cause birth defects in the fetuses of infected women, especially microcephaly.

Number 2, EpiPen prices: Nothing drew the public's attention to the dramatic rise of prescription drug prices more than a huge jump in the cost of the EpiPen allergy treatment, which topped \$600 this year, up 550% since Mylan began selling the product in 2007.

Number 3, Life Expectancy: Surprising news that the nation's mortality rate rose for the first time in 40 years, mainly due to higher deaths from heart disease and stroke. The life expectancy dropped from 78.9 to 78.8 years. Cause attributed to the Diabetes epidemic.

Number 4, Painkiller addiction. Fentanyl, a synthetic, cheap opioid 50 X as powerful as heroin, helped fuel the crisis this year.

Number 5, Gene editing: CRISPR-Cas9, a genetic-engineering tool to edit DNA in living organisms shows promise for new treatments of disease.

Number 6, Tainted water: Tap water with dangerously high lead levels created a public-health crisis in Flint, Mich., and sparked fears around the country.

Number 7, Transgender health: Medical services and support for transgender people expanded last year.

Number 8, Obamacare woes: It was tough going for the Affordable Care Act, known as "Obamacare," *not affordable*.

Number 9, Screen time: Screen time may have some benefits after all. The popular Pokemon Go game that captured the country's attention this summer led to users taking 1,500 more steps a day than usual.

Number 10, Sleep: Sleep deprivation causes us to gain weight and become less emotional stable and makes it harder to read other people's facial expressions, research shows.



(Information for the above came from Sumanthi Reddy's article which appeared in the Dec. 29th edition of the Wall Street Journal.)

"I just stuck myself with a needle—WHAT SHALL I DO?"

Answer: Wash the stick area with soap and water and then get Rx against Hepatitis B and C and HIV within two (2) hours.!

By 2011, most US health care workers have been immunized with the Hap B vaccine and approximately 95% are protected. In the unusual instance in which a susceptible worker has an occupational exposure to blood the worker should receive primary immunization irrespective of the probability that the source patient was HBV-infected. In instances in which the source patient is HBV infected, 1 dose of hep B immune globulin (.06 mg/kg, HBIG) should be administered concurrently with the first vaccine dose to provide passive protection until the vaccine induced antibody appears. Passive HBIG prophylaxis should be given as soon as possible after exposure and within 24 hours. If the worker refuses vaccination a second dose of HBIG should be administered 1 month following the exposure. Follow-up for susceptible health workers should include a hepatitis panel (HBsAg, HBsAb, and antiHBc) and liver enzyme measurements 6 months after exposure and at the time of the third dose of vaccine.

In managing Rx for those who have exposures to HCV, test the exposed health care worker at the time of exposure for antibodies to HCV and for HCV RNA (by polymerase chain reaction (PCR), then monitors exposed workers at periodic intervals at a minimum of every 2 months both of anti-HCV and for HCV RNA by PCR. An individual found to have reproducibly positive results by PCR is referred to the hepatology service for follow-up and management. The hep team follows the patient up for a minimum of 2 additional months to see if the worker spontaneously clears the infection. If the infection does not resolve the worker is treated for acute HCV infection .

Prophylactic rx for HIV is Combivir + metoclopramide (to prevent side effects from the Combivir).

- 1 in 3 needle sticks are + for Hep B in Hep B patients.
 - 1 in 50 needle sticks are + for Hep C in Hep C patients.
 - 1 in 330 needle sticks are + for HIV patients.
 - 1 in 3,300 mucous membrane (eyes, mouth, etc.) contamination.
- Needle sticks can transfer bacteria, protozoa, viruses and prions.

Average cost of treatment is \$2,500/per stick, thus many refrain from getting treated.

Warnings: Wear glasses in surgery; no not use hemostats for suturing and dried blood is contagious. While the infectiousness of HCV and HIV decreases within a couple of hours, HBV remains stable for more than a week.

MYSTERIOUS RADIO SIGNALS DETECTED COMING FROM DEEP SPACE

Scientists have detected six radio bursts from a region in deep space, far beyond our Milky Way, where they had previously uncovered similar signals according to a report in the The Astrophysical Journal.

The fast radio bursts (FRBs) only last milliseconds but can generate as much energy as the Sun in one day. The signals have caused some head scratching and, theories that intelligent beings are trying to communicate with us.

Scientists recorded receiving the first signals in Puerto Rico at the Arecibo radio telescope within just 10 minutes of each other. This time, a team of researchers from McGill University in Canada reported the signals coming from the same spot.

"We report on radio and X-ray observations of the only known repeating fast radio burst source, FRB 121102," the team wrote.

"We have detected six additional radio burst from this source: five with the Green Bank Telescope at 2 GHz, and one at 1.4 GHz with the Arecibo Observatory, for a total of 17 burns from this source.

In total, 17 FRBs have been detected from the same location, including some this past March. The first signals were detected in 2012.

Breakthrough Listen, a program of scientific exploration at the Univ. of Calif. Berkeley funded by Facebook CEO Mark Zuckerberg, Russian entrepreneur Yuri Milner and physicist Stephen Hawking, released a statement saying it would conduct follow up observations.

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"EMPIRE OF THE AIR" The Men Who Made Radio"

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A New Empire for a New Century

BACKGROUND: Most people believe Marconi invented the radio; he did not. His contribution was the wireless telegraph, which permitted the transmission of coded messages through the air. Radio made a huge leap beyond the coded confines of the telegraph. The new medium of radio was to the printing press what the telephone had been to the letter; it allowed immediacy. It enabled listeners to experience an event as it happened.

Lee De Forest, Edwin Armstrong & David Sarnoff. Those who created radio experienced stunning defeats...De Forest made and lost 3 fortunes, was married 4X and nearly went to jail for fraud. Sarnoff's aggressive nature earned him the enmity of many. Armstrong, lost almost his entire fortune suing the RCA (*Radio Corporation of America.*)

THE DE FOREST FAMILY had moved to Talladega, Alabama for Lee De Forest's minister father to take over the presidency of Talladega College, an institution founded to educate freedmen, about 40 miles SE of Birmingham in 1879.

Because of Henry De Forest's commitment to educate the blacks, the family was excluded from the daily life of the whites in the town. The wounds of the Civil War still festered in Talladega. Life was harder still for the children. The blacks shunned them and the "Rebs" hated them. At times things seemed unbearable for young Lee.

In the grammar school Lee de Forest surpassed everyone easily. Soon he progressed to the higher levels of arithmetic and math, and when he was sixteen, "hateful Greek" and Latin were "inflicted upon" him by his father.

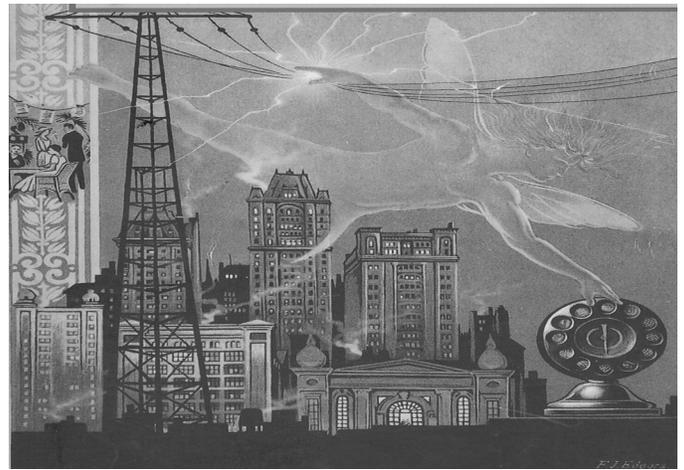
The opportunity for informal learning, however, offered de Forest the best chance to excel. When the college opened a carpentry shop complete with lathes, drill presses, and saws, he was there to study the working of the machinery as much as to make things. A company from the North began an ill-fated venture mining a nearby hill for ore and smelting it into pig iron. De forest followed with fascination the reaction of the blast furnace for smelting and the building of the narrow-gauge tracks to carry the ore from the mountain to the furnace. Later, when the smelter was operating, he studied "the details of how pig iron is made, the relative quantities of ore, limestone, and coke that are dumped into the furnaces." Still later, when the company closed, he and his brother Charles delighted in careening down the incline in the ore cars. "It was then," de Forrest once said, "that the real value of the blast furnace became apparent to us boys!"

The most important element of the de Forest's informal education, however, came through his own reading. His appetite was insatiable, his range eclectic. He read his Bible carefully, considering the Book of Daniel his favorite. By his early teens he had secured a key to the college library in Swayne Hall. There he spent hours poring over the *Patent Office Gazette*. He read voraciously in other areas as well.

The *Illustrated Youth's Companion*, arrived at the De Foest household every week. "A fine paper—couldn't be without it," Lee declared. While de Forest read the adventure stories in the *Youth's Companion* faithfully, and even attempted to place a story of his own in its pages (it was rejected), he paid more attention to the scientific reports, especially those concerning mechanics and electricity. He carefully preserved articles that described how an electric motor works, how to create an induction coil, how to make an electric bell, how to make magnets, and other experiments in electricity.

From the YC (*Youth's Companion*) pages he learned about electroplating and was able to purchase "a small silver plating outfit." With it, he renewed the utensils of his neighbors. "Got Mrs. Andrews' 1/2 doz. Forks and plated them for 75 cents" he recorded in his journal "making money." With the profits from his plating business, he purchased an electric lamp, a Weeden upright steam engine and a small electric motor. Wrapping some copper wire about a steel core, probably a nail, he also built his first electrical device. Attaching it to a battery, he could create an electromagnet capable of lifting iron filings or small tacks.

Lee de Forest, relying on his imagination, powers of close observation, and ingenuity, was beginning to build and invent. With wood



gathered from the cellar of his house, he created scale replica of a locomotive engine, a blast furnace and a medieval fortress complete with moat and operating drawbridge. The locomotive was of special import. After studying diagrams in the *Mechanical Encyclopedia* and an engine in a nearby rail yard, de Forest used "an elaborate assortment of large, square packing cases, sugar barrels, paint kegs, and a tin can for a whistle. The impressive engine attracted the attention of all in the neighborhood and even the gentry of Talladega, who brought their children out from town to see the Yankee boy's creation. More than six decades later, Miss Kate Savery, the daughter of one of the slaves who had worked as a carpenter building Swayne Hall, wrote de Forest of the vivid memories she and her sister had of their childhood in Talladega, "especially your train on the lawn."

From the *Patent Office Gazette* and the *Mechanical Encyclopedia*, de Forest studied carefully for hours the pictures of inventions. Soon he had filled a flat pasteboard box with intricate copies of drawings that particularly interested him. When a neighbor asked, "Does Lee know what his is doing?" his mother replied simply, "Oh yes, he must understand those subjects very thoroughly for he is always inventing and drawing."

As he grew older, de Forest increasingly turned from mechanical imitation to invention. For the double bed he shared with Charles, he invented a "bedstick," a thickly padded piece of black walnut with which he kept his brother from sleeping on the diagonal. Successful with this, he turned his attention to a perpetual motion machine. In this there was no thought of failure. To the completed plans, de Forest appended a note:

"I am actually amazed that I, a mere youth of 13 years, by my inventive genius and concentrated thought and study, have succeeded where illustrious philosophers in times past have failed. I have at last furnished to humanity a machine which, without cost, can supply forever any and all demands of the human race for power."

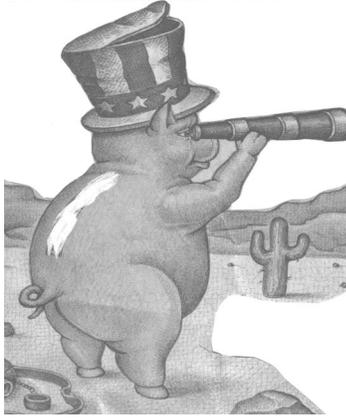
Not all his inventions were quite so successful. "I had yet to learn that invention is itself a process of constant disillusionment, of tearing down and building anew, and that many an invention has been destroyed in a single blast by the sudden emergence of new facts," de Forest reflected many years—and many disappointments—later. That lesson came early on, however. Attaching the family hairbrushes and combs to a machine of his own creation, he tried to improve on the cotton gin, but with unfortunate results. Undaunted, he drew up plans for a farm gate that could be opened without dismounting from a horse.

Set apart from the others by his size (small) and his homeliness, Lee de Forest tended to follow a "usual routine" as he called it—of doing chores and schoolwork tending to his nearly blind mare; playing tennis, chopping wood; swimming in the creek; shooting sparrows; practicing his cornet; making models; playing with electrical and mechanical gadgets; "inventing"; praying; and reading the Bible.

Working for, with, and against his father, whom he viewed with respect mingled with dread and trepidation, was also a part of Lee's daily life. (Continued Next Issue)

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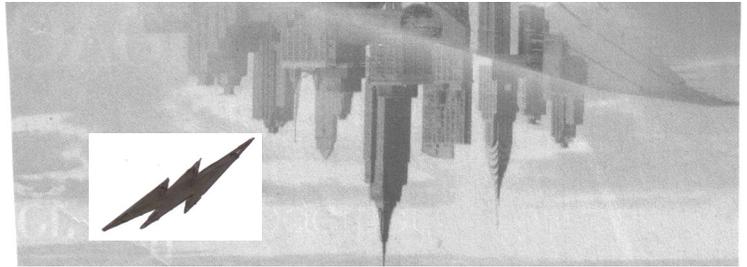
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