

Society of U. S. Naval Flight Surgeons



Naval Aerospace Medical Institute, Code 32
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NEWSLETTER

APRIL 1990

PRESIDENT'S COLUMN

“A Kinder and Gentler Medical Arena”

Having recently attended the sixth semi-annual Quality Assurance/Risk Management Seminar, sponsored by the Naval School of Health Sciences, Bethesda, Maryland, I am inclined to dwell on the subject for a couple of paragraphs.

First of all, I must say, to no surprise of any brilliant Flight Surgeon, that QA/RM is here to stay! Don't plan to avoid it by joining CIVLANT, or you will be in for a **shocking revelation**. 3rd Party Payers are already telling our civilian counterparts how to practice. The British and Canadian Health Services are being looked at for adoption in this country. The skyrocketing (for lack of a better buzz-term) costs of healthcare are the genesis of this obvious unacceptable medical revolution.

Secondly, I am convinced that the Surgeon General is holding a true course when he made the campaign promise to over-haul the QA and Credentialing programs. Concerning QA, he said: “We must focus on the care we provide and not target our providers. Let this program show us where we excel, as well as areas in which we can improve, document the high quality of care we provide, and identify weaknesses in our system.” The new QA has happened. The “new Credentialing” is to follow soon. Credentialing “changes” won't make life for the practitioner significantly easier, but it will save many migrainous cephalalgias for the administrators.

As for the “new QA” I am not necessarily going to try and convince you that it is the termination of all our burdens associated with health care delivery. ..the mechanics of the program are a little less encumbering (an administrative easing) but most importantly it is supposed to remove the paranoia of retribution should a

therapeutic misadventure or other “screw-up” be identified. We shouldn't have to practice spooked. And we shouldn't take on a “search and destroy” mission. ..but we definitely are to give credit to those providers working hard and taking time to do it right!

A third emphasis if you have an “attitude” about QA. Take time to enlighten yourself on what it really is (besides just the formal definition). Quality Patient Care: **The degree to which patient care services increase the probability of desired patient outcomes and reduce the probability of undesired outcomes, given the current state of knowledge.** Learn the goals. Learn the objectives. Learn how it focus' on improved care which makes you a **better clinician**. The 1990s promise an increasingly more structured medical environment. Take the effort to pick up some QA “survival skills”. Life in the clinic (or hospital during and after GME) will go much easier. We will have happier and more satisfied patients as well. You can get involved now, or sit back and wring your hands in frustration. You help drive this program, which is much bigger than any greyhound, or let someone drive it for you. I am not going to come out and say that “new QA” is no longer a paper tiger, but I will say that it has the potential for taking less time. The more we all know how to work it the easier it will become. More local autonomy is possible with the new instruction. It is the medical officers program and we should take charge and run with it. But by no means do we, the medical officers, have to do the “busy” work. A support staff to assist the practitioner with the appropriate portions of local QA programs is a well recognized necessity.

If you are “scoffing” by now, as though I have “bought into the establishment”, you are absolutely right! And you are also suggesting that it is possible to practice medicine in this day and age without standards, just like we can fly naval aircraft without NATOPS and SAFETY procedures?

We most certainly have a kinder and gentler QA arena. Trust me, I'm a doctor.

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SECRETARY-TREASURER NOTES

In this month's newsletter you will find the ballot for this year's election, as well as a self-addressed return envelope. Ballots may be mailed to me or presented at the time of our annual meeting. The deadline for submitting ballots will follow adjournment of the meeting on Sunday 13 May 1990. Please keep in mind that your membership status must be up to date (paid through April 1990) in order to be an eligible voter. You can check your dues status by looking at the address label on your newsletter. The digits on the first line reflect the fiscal year through which your dues are paid. Anyone with 89 or less owe dues now, and you are welcomed to submit past or future year dues with your ballot. In addition, in order to be a voting member of SUSNFS, you must also be a member of the Aerospace Medical Association.

The Society's by-laws provide a leniency period of one year on expired dues, however, because of our unusual fiscal year (1 May to 30 April) and many member's operational assignments, this period was not strictly adhered to. This allowed delinquent members to continue receiving the newsletter after their dues status had expired. During last year's officer's meeting, it was determined that an absolute maximum of two years would be allowed. Therefore, our membership roster still reflects numerous members that owe dues since 1988. Unfortunately, if dues are not received from these individuals by 30 April 1990, their names will be deleted.

The Society's policy has been to pay return postage for non-deliverable newsletters. Often a change of address is noted by the postmaster and this has provided a means of updating addresses. Timely and accurate address changes may be made more effective if you notify the Secretary-Treasurer directly when you have an address change and will insure uninterrupted delivery of the newsletter.

This represents my last notice as Secretary-Treasurer. It has been a pleasure to have served in this capacity during the 1989-1990 year. I am pleased to report that the Society's financial status remains solid. A complete and formal report of the financial and membership status will be presented at the annual meeting. I hope that all of you can attend our annual meeting as well as the ASMA meeting in May.

CDR MICHAEL R. VALDEZ MC USN
NAMI (Code 32R)

ELECTION OF SUSNFS OFFICERS

I know this falls into the category of "didn't we just do this?", but it is time to cast our votes for a new crop of candidates who have been nominated for election to the exalted offices of SUSNFS Board of Governors. If you will not be attending the annual meeting at New Orleans, I would suggest you fill out the enclosed ballot while it is fresh in your mind and mail it in the envelope provided. If you are coming to New Orleans and plan to vote there, ballots will be available, or fill yours out now and bring it along with you. The candidates on the ballot have been certified by the Secretary to be members in good standing, and have been approved by our President, Capt. Hill. I look forward to seeing all of you in May.

G.G. REAMS
CDR MC USN
Chairman, SUSNFS Nominating Committee

FROM THE FLEET

LAND ANTI-EXPOSURES GUIDELINES IN THE COLD ENVIRONMENT

Just when you've packed away your hypothermia briefs, thinking about the warmer weather and its associated threats, along comes the coldest Arctic storm to hit CONUS in years. The outside air temperature (OAT) dropped in the Fallon, NV working areas to well below freezing levels and my Commanding Officer says "when is it time to call it quits for the day and head for the club?" The aircraft has its operating limits; but, what about the aircrew?

OPNAVINST 3710.1M specifies clearly over water conditions for anti-exposure gear where immersion is expected. Water temperature, OAT and expected SAR recovery times are given for the CO's guidance. Exposure of aircrews to harsh winter conditions on land without water immersion is another matter. Aircrews in Norway or other regions where these conditions exist should have guidelines.

Individual tolerance to cold varies greatly. There is no definite fatal exposure to dry cold, primarily because the individual, by working or exercise, can generate heat. Reducing the variables, one can assume the worst case scenario where the aircrewman is incapacitated.

Figure 1 has a grouping of curves based on a man/woman, wearing various types of military clothing, resting or doing light work in relatively still air. The curves show tolerance time as a function of air temperature. A body temperature decrement of 1°C has been used in this study as the tolerance limit.

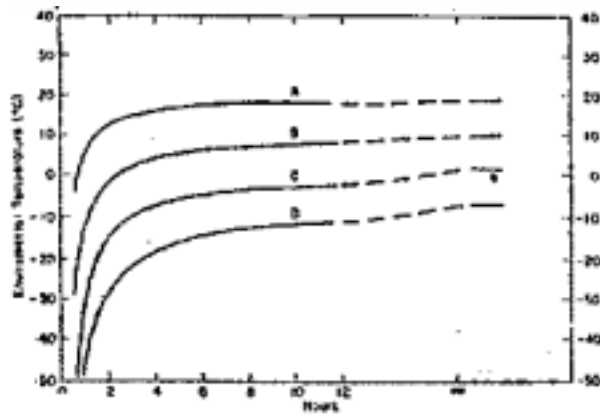


Fig. 1 Time Tolerance in Hours—Dry Cold Exposure.

Curve A, which represents tolerance limits for a man dressed in high coveralls such as a flight suit, gives an exposure time of only 20 - 30 minutes for an ambient temperature of -5°C (23°F) and an indefinite period of time at an OAT of 20°C (68°F). Curve B, shows the limits for a man wearing long wool underwear, flightsuit, and a jacket. He can endure 30 minutes at -30°C (-22°F) or endure 10°C (50°F) indefinitely. Curve C is a man wearing an additional wool shirt and pants and curve D is one wearing an outerwear of downfilled material.

A drop of 1° body temperature will induce shivering to support efforts in thermal homeostasis. So where can one make decisions pertaining to significant body temperature loss and potential loss of life? Assuming that cardiac arrhythmias begin at approximately 33°C (91°F) core body temperature one can begin "reasonable" conclusions.

Using figure 1 linear extrapolation will allow you to assume that a 4°C drop in temperature will occur when dressed in a flight suit only, after only two hours exposure to an OAT of -5°C (23°F) or eight hours exposure to the same OAT if in longjohns and flight suit. This linear assumption (it's not linear due to homeostatic mechanisms but a reasonable assumption) is not totally valid, but, is a reasonable approximation for your particular needs. If SAR cannot effect rescue in the known terrain within two hours, your aircrew is in peril if only wearing a flight suit and is incapacitated. This would not be an unreasonable assumption if certain snow conditions existed and the aircrewman was unable to assist in the location efforts due to incapacitation.

We all know that common sense does not always prevail in the ready room. So what did I recommend to the Skipper? "Poopysuit" liners or longjohns were to be worn and flight jackets on all flights where OAT was below freezing and curtail all flights below 0°F (-18°C). These would be relatively safe limits if the SAR effect was less than two hours in a worst case scenario. This does not cover all operational situations, but it did fit our needs. Hopefully a change in general NATOPS will provide further guidance on this varied situation.

LCDR TERRY RAST MC USN

CODE 42 SPEAKS

The Aeromedical Advisory Council, (AAC) meets monthly (usually) and considers topics of concern in aviation medicine. Subjects for deliberation are determined based, in large part, by what I see coming across my desk from the fleet. For example, if I see that we are consistently recommending waivers for a specific condition, it might make sense to make that condition NCD, or to alter the standards applying to that condition. I also rely on communication from operational flight surgeons to let me know if something in the physical standards arena doesn't make sense, or if you have a more efficient way to do your job. If you have an item which you think might be appropriate for AAC deliberation, please let me know.

Recent AAC recommendations which have been approved by BUMED 02 are as follows:

1. Nasal Antral Windows Surgery will no longer be considered disqualifying. The underlying condition requiring the surgery should be the sole factor determining the status of PO vs NPO.

2. Nicorette gum used as an adjunct for smoking cessation is NCD providing the individual is enrolled in a formal smoking-cessation program, displays no adverse effects from use of the gum, and is closely monitored by his flight surgeon. Use is limited to 3 consecutive months of treatment. Use is permitted during flight only under conditions of flight in which NATOPS allows smoking.

3. Individuals on Lisinopril as a single drug for treatment of mild-moderate hypertension in the dosage range of 2.5-20 mg/day may be considered for a waiver on an individual basis.

4. Cycloplegic eye examination is no longer required for an aviator whose visual acuity falls below 20/20 for the first time. A manifest refraction with a dilated fundus exam is all that is required. You should refract the individual to his best visual acuity (eg. 20/15, 20/10, etc.), but also report the refraction which corrects him to 20/20.

5. Personnel who undergo a single intraocular lens implant no longer require a Special Board of Flight Surgeons to return to flying. Waivers will be considered on an individual basis for return to Class II or SG II or SGIII flying. The **minimum** information required for waiver consideration will be the operative report, **VERHOEFF** depth perception testing, and glare testing.

6. Red lens testing is no longer required for aviation personnel. Anyone not meeting the phoria standards will require a full eye muscle work-up.

7. History of eye muscle surgery is considered disqualifying only for personnel whose physical standards require stereopsis. All candidate student naval aviators with a history of eye muscle surgery must be examined

by NAMI ophthalmology before a waiver will be considered. All other personnel will be considered on an individual basis with a local work-up.

8. Landing signal officers (LSO's) must hold a valid, current clearance notice (up chit) in order to perform LSO duties.

9. Doxycycline 100 mg daily may be used in conjunction with chloroquine base 300 mg weekly for prophylaxis against multiple drug - resistant **P. falciparum** in aviation personnel providing the local NEPMU recommends its use in the area of deployment, the individual is closely followed by a flight surgeon and is grounded for a minimum of 72 hrs. at the institution of therapy to evaluate side effects.

Hopefully, these changes will make your life somewhat easier. Several AAC recommendations are being incorporated in the new Chapter 15 (coming to your local newsstand soon!). Keep those cards and letters coming.

CAPT. DICK WEAVER MC USN
NAMI Physical Qualification, Code 42

ULTRAVIOLET PROTECTION FOR THE NAVAL AVIATOR

It is a well documented fact that excessive ultraviolet radiation exposure can cause various pathological changes in human skin. These changes can present as a simple sun burn or become more serious and develop into different types of skin cancer.^{1, 2} Recently, it has been postulated that excessive ultraviolet exposure can lead to certain ocular changes, including cortical cataracts and macular degeneration.³

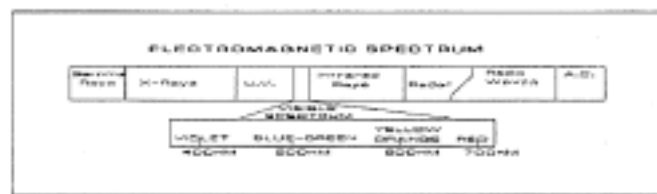


Figure 1

As you can see from looking at the electromagnetic spectrum (figure 1), ultraviolet radiation is located just to the left of the visible spectrum. The human eye can see light which is located only within the visible spectrum, a fraction of the center spectrum. Any other electromagnetic radiation is invisible to the eye. Because of the location on the spectrum, ultraviolet radiation cannot be seen by the human eye. The fact that ultraviolet radiation is invisible to our visual system makes it more dangerous, simply because its presence cannot be detected. We all have heard about the person who goes

to the beach on a cloudy day not expecting to get a sun burn simply because the sun is not out, but actually ends up with the most severe sunburn of the season. This occurs because certain ultraviolet rays easily penetrate clouds, allowing the skin to absorb the rays.

Absorption of ultraviolet light is the root of our problem. In the eye, several structures are much more susceptible to ultraviolet radiation than others.

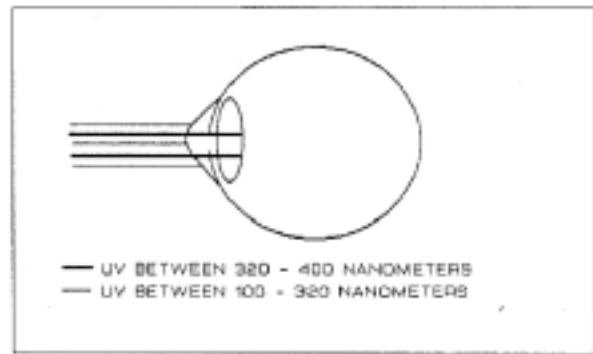


Figure 2

Figure 2 shows that different wavelength ultraviolet radiation will be absorbed by different structures of the eye, although most ultraviolet is absorbed by the anterior or front part of the eye. The type of ultraviolet radiation we are most concerned with as aviators is ultraviolet B (290-315 nanometers), because this is the type which has been associated with early lens changes thought to develop into cataracts.^{4,5}

Changes in the crystalline lens of the human eye generally will cause an overall decrease in visual acuity over time. Any permanent degradation in visual acuity would mean no more flying for those affected with these changes. The changes which have been postulated include cortical cataracts and macular degeneration.

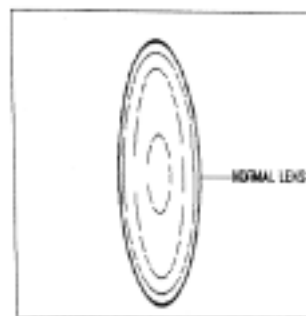


Figure 3

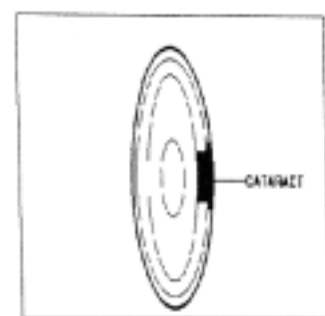


Figure 4

Figure 3 represents a normal crystalline lens. The rings located around the lens are normal striations within the structure. Figure 4 depicts a lens with an opacity in the posterior subcapsular region of the lens. This opacity is a cataract. It simply does not allow light to pass through the lens in a normal fashion. Ultraviolet B radiation has been linked with opacities affecting the cortex, or non-nuclear regions of the lens.

A recent epidemiologic survey of 838 Chesapeake

Bay fishermen displayed the risk of overexposure to ultraviolet radiation. The study concluded that the greater the exposure to ultraviolet radiation, the greater a chance that cortical lens changes would develop. The study also concluded that simple protection such as ultraviolet blocking sunglasses and brimmed hats substantially decreased the risk of lens changes secondary to ultraviolet exposure.⁶ Although there has not been a study of aviators, it is logical to conclude that because of the aviation environment, naval aviators are generally more susceptible to the ill effects of ultraviolet radiation, and must therefore take appropriate precautions when flying.

Presently, ocular protection for aviators consists mainly of polycarbonate visors (either clear or tinted, and standard issue N-15 sunglasses.⁷ The clear polycarbonate material, from which the visors are currently fabricated, will block all ultraviolet radiation below 350 nanometers, allowing only 60% transmittance of ultraviolet radiation in the innocuous 350-400 nanometer range. Tinted visors afford even better protection. Standard plastic spectacle lenses, made of polymethyl methacrylate (CR-39), have negligible transmittance in both the ultraviolet A or B ranges. Only standard, non-tinted or treated glass spectacles transmit a substantial amount of ultraviolet B radiation. In all instances, a standard tint will reduce the amount of ultraviolet transmission to safe levels, and specific ultraviolet protective coatings will block 100% of all ultraviolet radiation.⁸

The protection presently afforded naval aviators is quite sufficient to protect them from harmful ultraviolet rays. Present helmet visors are made of polycarbonate, a polymer which blocks 100 percent of the **harmful** ultraviolet rays. Tinted visors afford equal protection. In addition to our visors, standard issue Navy sunglasses block approximately 98 percent of harmful ultraviolet radiation. Protective eyewear generally is not the problem; getting the aviators to use it, and believe in it is! Regular reminders in the form of squadron briefs, newsletters and posters will be the best tool for the flight surgeon and physiologist to utilize in combating the harmful effects of ultraviolet radiation, and ensuring that aviators know that their flight safety equipment is effective.

Footnotes and Bibliography

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- ² Loewenstein, EV. Ultraviolet radiation protection: How much is needed? J Am Opt Assoc Sept 1989: 648-9.
- ³ Taylor HR, West SK, Rosenthal FS, et al. Effect of ultraviolet radiation on cataract formation. N Engl J Med 1988; 319:1429-33.
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⁵ U.S. Navy Handbook for Category II Laser Systems Safety Officer, 1988.

⁶ Taylor HR, West SK, Rosenthal, FS, et al. Effect of ultraviolet radiation on cataract formation, N Engl J Med 1988; 319:1429-33.

⁷ Department of the Navy OPNAV Instruction 3710.6P. The Naval Aviation Safety Program. Feb 1986.

⁸ McDonough AF. Spectacles, Ultraviolet Radiation, and Formation of Cataracts. N Engl J Med 1989; 321 :21 ;1477-79.

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4. Lerman S. Human ultraviolet radiation cataracts. Ophthalm Res 1980; 12:303-14.
5. Adler, FH. Adler's Physiology of the Eye. Edited by Moses. 6th Ed. CV Mosby Co. St. Louis: 1975.

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NAMI Ophthalmology Code 23

RAM'S CORNER

THE FLIGHT SURGEON AND OCCUPATIONAL MEDICINE

A recent review of commercial airline operations by Roy L. DeHart noted that ground personnel make up about 74% of the United States carrier workforce, and that 65% of available medical resources were committed to non-flying employees in support of typical occupational medicine services. Flight surgeons are usually aware that they are the local experts on health issues unique to the flight environment, such as hypoxia, acceleration, hypobarics, and circadian rhythm disruptions, but often overlook the more mundane and perhaps difficult opportunities in occupational medicine, which involves the total workforce, those in a flight status and ground personnel.

Components of an airline occupational medicine program, listed in DeHart's article include preplacement examinations, health hazard reduction, management of job-related illness and injury, return-to-work evaluations, health maintenance programs (employee assis-

tance, lifestyle risk reduction, and smoking cessation), and hazard communication programs. Each of these components is part of the Flight Surgeon's job and requires the cooperation of the Flight Surgeons, the AVT, and the staff of the local clinic or hospital for proper implementation.

Preplacement examinations: The appropriate physical examinations and/or updates for aircrew fall into this category. Important for ground personnel are Explosive Driver physicals, Respiratory Physicals, and screening for the Personnel Reliability Program.

Health Hazard Reduction: This program addresses stressors in the workplace such as noise and other physical and chemical hazards. This required a collaborative effort involving the Safety Officer, the Industrial Hygienist (often a civilian), and the Flight Surgeon. Often, if the Flight Surgeon is not aggressive in letting the Safety Officer know that he is as interested (or more interested) in prevention by reducing such hazards rather than providing medical disposition after harmful exposures, he will be left out of this loop altogether.

Return-to-Work Evaluation: All squadron personnel, both ground and those in a flight status, should notify the AVT or Flight Surgeon on returning to work after **any** job-related illness or injury.

Health Maintenance Programs: Active involvement in the Physical Readiness Program (usually in collaboration with the Branch Officer in charge), an aggressive weight control program, smoking cessation emphasis, blood pressure screenings (during safety stand-downs), and efforts to increase the percentage of the squadron CPR qualified, are all challenging but necessary efforts in the health maintenance arena. Health maintenance involves more than just hearing conservation.

Hazard Communication Program: Your squadron should be aware of any potential chemical health hazards to which they may be exposed in the workplace and how to recognize adverse health effects. The wearing of proper protective gear, the location and proper use of eyewash stations, and related topics, can be addressed during safety standdowns or in specific departmental briefs.

Management of Job-Related Illness and Injury: Neurosensory hearing loss, repetitive trauma (carpal tunnel syndrome, tenosynovitis, Raynaud's syndrome), strains and sprains, dermatitis, cuts and lacerations, foreign bodies in the eye, and respiratory tract problems are occupational medicine problems commonly experienced in the hangar environment, and not unique to the issues of physiology in flight. Cullen et al in the NEJM lists the 20 most common occupational diseases diagnosed in the New Haven area between 1979 and 1987. The article does not address occupational medicine issues as they relate to aviation but is an excellent review of new knowledge about occupational medicine topics, in general.

I know there is a lot to do. You have many responsibilities, but the chances are that where you are, you are the Occupational Medicine expert and a good occupational medicine program is an essential part of your work as a Flight Surgeon.

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DeHart RL. Occupational Medicine Support for International Air Carriers, Aviation, Space, and Environmental Medicine, Jan, 1990.

CDR F. H. JENKINS MC USN
Aerospace Medicine Resident

AsMA MEETING

Next stop! New Orleans - AsMA - We (West/East coasts) will be requesting NALO flights, not for Sunday arrival, but for Saturday. Make your hotel reservations accordingly. The SUSNFS business meeting will start promptly at 1600, Marriot Hotel!

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-- EDITORIAL POLICY--

The views expressed are those of the individual authors and not necessarily those of the Society of U.S. Naval Flight Surgeons.

This Newsletter is published quarterly by the Society on the first of January, April, July and October. Material for publication is solicited from the membership and should be typed **double spaced**, reaching the Editor at least one month prior to the scheduled date of publication. Unsigned material will not be considered.

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Society of U. S. Naval Flight Surgeons



1990 OFFICIAL BALLOT

Please Vote for Only One Person Per Office

INSTRUCTIONS: Do not put your name on this ballot. Please mark your choices and return it in the envelope provided. Or, you may vote at the 1990 SUSNFS Annual Meeting on Sunday evening, May 13, (to be held concurrently with the 1990 Annual Meeting of the Aerospace Medical Association in New Orleans, La.)

NOTE: Dues must be paid up for ballot to be counted. Please check your address label, which should show "90-91" or greater, or "LI" for Lifetime members. Checks in the amount of \$10.00 will be accepted with the returned ballot to bring dues current.

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