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UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN (RET)

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Notice

Due to the critical shortage of medical officers, the Chief, Bureau of Medicine and Surgery, has recommended, and the Chief of Naval Personnel has concurred, that Reserve medical officers now on active duty who desire to submit requests for extension of their active duty for a period of three months or more will be given favorable consideration.

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Residency Training Policy for Reserve Medical Officers on Active Duty

BUMED INSTRUCTION 1520. 7 dated 4 August 1954, promulgates and prescribes the Department of Defense policy with respect to residency training programs for medical officers of the Regular Navy and U. S. Naval Reserve.

1. In addition to medical officers of the Regular Navy, Reserve medical officers who are on active duty, and who have completed their obligations for active duty imposed by the Universal Military Training and Service Act, as amended, are now eligible to compete for assignment to residency training in naval hospitals, in those specialties in which there exists a definite shortage at the time of application for such training.

2. At the present time shortages exist in the residency training program in the following specialties: Anesthesiology, Otolaryngology, Ophthalmology, Pathology, Orthopedics, Obstetrics and Gynecology, Pediatrics, and Urology.

3. Eligible and interested Reserve medical officers should make application to the Bureau of Medicine and Surgery, via the chain of command.

SPECIAL NOTICE

TO ALL ADDRESSEES (EXCEPT U.S. Navy and Naval Reserve personnel on ACTIVE DUTY and U.S. Navy Ships and Stations).

Existing regulations require that all Bureau and office mailing lists be checked and circularized at least once each year in order to eliminate erroneous and duplicate mailings.

It is, therefore, requested that EACH RECIPIENT of the U.S. Navy Medical News Letter (EXCEPT U.S. Navy and Naval Reserve personnel on ACTIVE DUTY, and U.S. Navy Ships and Stations) fill in and forward immediately the form appearing below if continuation on the distribution list is desired.

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Editor

(Detach here)

Chief, Bureau of Medicine and Surgery _____
Department of the Navy, Potomac Annex (date)
Washington 25, D. C.

I wish to continue to receive the U.S. Navy Medical News Letter.

Name
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Activity _____ Ret _____
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(Please print clearly. Only one answer is necessary.)

Letters of application should contain an agreement to volunteer for the period of residency training requested, and to remain on active duty in the Navy for a period of 1 year following completion of the training, for each year of training received. In general, the Bureau prefers to approve officers for residency training on a year-to-year basis.

4. From time to time the list of medical specialties in which shortages exist will be revised and brought up to date, to reflect the then existing needs. (ProfDiv, BuMed)

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Recommendations Resulting from the USS Bennington Disaster

In a report to the Chief of Naval Research, Commander C. W. Norman, MC USN, who was the Senior Medical officer of the USS Bennington on 26 May 1954, states that: "From a medical view a number of salient points became apparent as a result of the Bennington Disaster and should be re-emphasized or placed in effect for future disaster planning purposes, whether under war-time conditions or in peacetime naval operations.

1. "Medical officers and other medical personnel should be assigned living quarters in various sections and decks of a ship so that they are dispersed as much as possible in case of a catastrophe similar to the one experienced by the Bennington. Fortunately, the hospital corpsmen's living compartment was undamaged but had the fire or explosion reached that area, all corpsmen, except the actual duty section in the sick bay, could have been killed or injured severely.

2. "The continual first-aid training program for corpsmen and ship's company which was in effect on the Bennington proved invaluable in the disaster, and paid remarkable dividends. The care and handling of the large number of casualties proceeded in a systematic, well-organized manner due to the fact that the corpsmen and crew were well versed in the practical application of first-aid principles.

3. "The importance of adequate dispersal of medical storerooms and the stocking of at least a 6-months' supply of medical materiel is to be stressed. In spite of the fact that a large quantity of parenteral solutions--bandages, cotton and other items-- were completely destroyed in the one medical storeroom which was demolished, there were sufficient stocks of all the necessary drugs and supplies in the undamaged medical storerooms in other parts of the ship to treat adequately all the casualties that resulted from the fire and explosion.

4. "The morbidity resulting from the disaster would have been materially lessened had personnel in the affected area of the ship complied with existing instructions to cover exposed parts of their body with clothing or other suitable material, when going to their general quarters stations.

The vast majority of the less seriously burned patients sustained flash burns of the arms, legs, and face, parts which were uncovered when they were exposed to the flash-type of fire which occurred. It was readily apparent in a number of cases that the first and second degree burns of the arms, legs, and face resulted from failure of personnel to button shirts, roll down sleeves, and tuck in trouser cuffs when the general quarters alarm was sounded. Even the slightest kind of covering would have prevented flash burns of the exposed parts.

5. "Personnel should be required to wear metal identification tags at all times in order that proper recognition of seriously injured or dead may be facilitated. Among the 91 dead personnel as a result of the Bennington disaster, it was determined that about a dozen of them were wearing the regulation metal identification tags. Accurate and quick identification was thus delayed, as were notification dispatches of kin. One civilian technician who flew aboard the carrier the evening preceding the disaster had no means of identification on him and except for recognition by acquaintances in the air group, his identity would have been markedly delayed. A number of pilots and crewmen who flew aboard the carrier the evening prior to the accident also had no identification tags or other identification aids, such as health records or dental charts. As a result of this lack of records and tags, the identification of dead personnel was delayed, as was an accurate listing of the dead for dispatch notification to the Secretary of the Navy.

6. "Because a majority of the fatal cases died as a result of asphyxiation in the lower decks of the ship, it appears imperative that some type of portable oxygen-breathing apparatus should be required as a part of the safety equipment available to all personnel, at least those whose battle stations are below decks, when they are called to general quarters. The standard life belts or preservers issued to ship personnel for use at general quarters have seldom been used in the past, even under wartime conditions, whereas, in the Bennington disaster and in many other previous shipboard catastrophes, the need by all personnel below decks for oxygen-breathing apparatus has proved to be of the utmost necessity. Many lives would undoubtedly have been spared had there been readily available some suitable type of portable oxygen-breathing equipment.

/s/ C. W. Norman
CDR MC USN"

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Electric Shock*

Attention is focused on portable electric tools as representative of the entire class of portable electric equipment. It is supposed that the

*Continuation of article, "Electric Shock", Vol. 24, No. 6, 24 Sept., 1954.

tools are used on a 115-volt, single-phase, a-c distribution system, and that power is supplied by the secondary of a transformer which is perfectly insulated so that any grounds on the primary side do not carry across the transformer to the secondary side.

A tool which is not provided with a grounding conductor is discussed in the article. A grounding conductor is a conductor which is entirely separate and distinct from those used to conduct power to the tool, and which is connected to the metal case of a tool at one end and to ground at the other end. It is shown that insulation alone, when in good condition, protects from electric shock even when no grounding conductor is present. It is then shown that: (1) A grounding conductor, when of proper size and correctly connected, will protect from shock even in case of insulation failures. (2) A grounding conductor must be of low resistance and adequate current-carrying capacity to do its job. (3) A grounding conductor of high resistance or inadequate current-carrying capacity will not protect from electric shock. (4) An incorrectly connected grounding conductor not only will not protect from shock but may cause fatal shock. (5) It is, therefore, essential that grounded receptacles on the distribution system, portable electric tools, their flexible cords, and their plugs, be correctly wired. It is also essential that grounded plugs be inserted into grounded receptacles in the right position.

Perfect Insulation. It is supposed that the insulation is perfect on the power distribution system, on the tool, and on the flexible cord; that the total capacitance to ground is very small, and that no grounding conductor is provided. Conditions are all right in this case. There is no way for current to get from one side of the distribution system to the steel deck, and also no way for current to get back to the other side of the distribution system from the metal handle of the tool held in the hands. Hence, no current can flow from the feet to the hands.

Perfect insulation is not easy or possible to maintain under all conditions. "Insulation failure" as used in this article does not mean a complete breakdown of insulation to the extent that the insulation resistance drops substantially to zero. It means a decrease from the high value of good insulation to a much lower value which can be dangerous to personnel. This lower value may be zero in the extreme case, or it may be higher, a few hundred or even a few thousand ohms. One insulation failure on an ungrounded system will not interfere with its operation. Neither will two failures, even if there is one on each side of the line, unless both are of very low resistance, not more than a few ohms. If the resistance to ground on one or both sides of the line is a few hundred ohms, the system will still operate all right even though the insulation resistance is so low that it would be dangerous for a man to stand on the steel deck and touch a live conductor with his bare hand. This point is stressed to emphasize that a distribution system may be operating satisfactorily so far as power distribution is concerned but still be dangerous if one of its live conductors is touched.

The steel hull, water, and perspiration are all inimical to safety from electric shock. Nevertheless, nothing can be done about them. Steel ships are here to stay, and it is extremely probable that in the future water and perspiration will be as indissolubly associated with naval life as in the past. They represent obstacles to safety from electric shock which cannot be removed from naval installations.

This raises a further question: Can anything be done to protect from shock despite these obstacles? Fortunately, it turns out that something can be done, and even more fortunately, that enough can be done to protect perfectly, provided that the necessary things are done. They will do no good if neglected.

Basically, two things can be done to prevent the flow of a dangerous current through an individual when he is connected in an electric circuit. One is to make sure that he is in series with a high resistance. The other is to make sure that there is only a small potential difference to cause current flow.

Because the purpose of the grounding conductor is to provide protection when insulation fails, great care should be exercised to make sure that it is of low resistance and of ample current-carrying capacity. Just any wire wrapped around a paint-covered stud or bolt is not enough. In case it is necessary to rig a grounding conductor for portable equipment when the grounded plugs and receptacles described are not installed, scrape off paint on the metal case of the equipment and on the ship's hull where the connection to the grounding conductor is made, and be absolutely sure that there are no breaks in the grounding conductor, that it is of sufficient current-carrying capacity, and that it makes good contact at both ends. A man's life may depend upon it. Furthermore, connect the grounding conductor before inserting the plug in the receptacle from which power is supplied and pull out the plug before removing the grounding conductor.

To facilitate connection of the grounding conductor, the Bureau of Ships has standardized grounded plugs and receptacles for all surface vessels of the active Fleet and a-c circuits in submarines. See chapters 60 and 62 of the Bureau of Ships Manual for information on plan numbers of the grounded plugs and receptacles to be used.

Three conditions must be satisfied to ensure that the grounding conductor will be connected correctly: (1) The connection in the receptacle must be right. (2) The connections between the flexible cord and the plug at one end, and between the cord and the tool at the other end, must be right. (3) The plug must be inserted into the receptacle in the right position.

The essential thing is to make sure that the ground contact of the plug is connected by the grounding conductor to the metal case of the tool or equipment. An extremely hazardous condition arises if one end of the grounding conductor is connected to the metal case of the tool or equipment,

and the other end is attached to a plug contact which touches any of the line contact in the receptacle. It is necessary to identify the line contacts and the ground contact correctly, connect the cable to the plug with great care, make sure that there are no loose strands of copper which may accidentally connect the grounding conductor to either side of the line, and finally, test the work after the connections have been made but before inserting the plug in the receptacle. Use a megger or insulation resistance measuring instrument to make this check if one is available.

If a megger or insulation resistance measuring instrument is not available, use any suitable means to make sure that there is a solid connection from the exposed metal case of the motor or equipment to the ground terminal of the plug, and that there is no connection from any exposed metal parts of the motor or equipment to any of the line terminals of the plug.

This test should also be made on all portable tools and equipment which have not previously been tested in this way, even though they may have been used previously without trouble. Previous use in itself is not enough to establish that the connections are correct. Other conditions may have prevented a shock when the equipment was previously used.

This test should be repeated after a new plug is installed on the tool or equipment, after any repair work is done on the equipment or plug, and after a fuse blows on a circuit on which the tool is being used. The fault which caused the fuse to blow may also have caused the ground connection to burn out.

Portable electric tools and equipment should be tested periodically to make sure that they are maintained in good condition.

Summarizing the results, it will be seen that when using a portable tool on an ungrounded system, assuming all connections are correct and that the plug is inserted in the right position, there are three lines of defense that protect from shock: (1) the insulation on the distribution system (this line of defense is absent on grounded systems); (2) the insulation on the tool and cord; and (3) the grounding conductor. Each of these three lines of defense, if it holds, is enough to save a fatal shock.

The Bureau of Ships has assisted in the production of a training film on electrical safety precautions. This film, MN-3485B, Electric Power Afloat, Electrical Safety Precautions, can be obtained from film libraries by following the instructions given in Catalog of Training Films for the United States Navy, Marine Corps, NAVPERS 230058 of 31 December 1952. The grounding conductor shown in this film is of the obsolete type which was used before the grounded receptacles and plugs were installed. There are a few other ways in which the film is somewhat out of date, but if shown and explained by a competent instructor, it should be of considerable value. It is strongly recommended that this film be shown and explained to all personnel. Electrical safety is of concern to all men afloat, not merely to Electrician's Mates. One of the responsibilities of the Electrician's Mate is to do his full part in seeing that the electrical installation is as safe as he

can possibly make it. Another responsibility is to see that his shipmates know and observe electrical safety precautions.

Although these articles are long, they do no more than begin to consider all the different ways in which a man can be killed by electric shock. There are many possible combinations of events which can lead to a fatal shock. The important things to keep in mind are: (1)If you do things in the wrong way when dealing with electric circuits and equipment, (a) some fortuitous combination of circumstances may save you from a fatal shock, or (b) a different fortuitous combination of circumstances may kill you. (2) If you do things in the right way in dealing with electric circuits and equipment you will be safe. This is the only way in which you can be sure of being safe. (3) The Bureau of Ships is vitally interested in providing the safest possible electric equipment for use by the men on U. S. Navy ships. But neither the Bureau of Ships nor any other organization can protect from electric shock. It can help personnel in various ways, but in the final analysis the men must do the job. It is a job well worth doing. It may be tiresome to study about safety, it may be unpleasant to devote the time and effort that are necessary to ensure safety, but it is far better to be safe from electric shock than to become deceased. (BuShip Journal, Aug., 1954; Lt R. L. Kline, USN, and Dr. J. B. Friauf, Electrical Branch, Bureau of Ships)

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Hospital Problems and the General Practitioner

A new interest is developing in the relations of the general practitioner and the hospital staff. The formation of the Joint Commission on Accreditation of Hospitals, the founding of the American Academy of General Practice with its active Hospital Commission, the hospital construction program, and increased hospital use with the growth of the voluntary insurance programs, have all contributed to this awakening interest.

The hospital accreditation program is a voluntary project financed entirely by contributions from physicians and hospitals. The sole purpose of the program is to raise the quality of medical care in American hospitals.

Accreditation by the Joint Commission means that the Joint Commission vouches to the public that "This hospital and its staff have voluntarily asked for a survey, and we, as a third party, have found that the quality of medical care administered here meets adequate standards." Before a hospital can be surveyed it shall have been in operation for one year, and shall have more than 25 beds. Hospitals that have full accreditation are visited every 3 years; those having provisional accreditation are

resurveyed only on reapplication after the hospital has indicated that deficiencies have been corrected. No hospital will be surveyed more than once a year nor less than once every 3 years.

Eight common reasons are responsible for failure to receive accreditation: fire hazards; reliable reports of fee-splitting or other unethical practices among members of the medical staff; evidence that non-medical practitioners are utilizing the hospital; unnecessary surgery, or excessive and unjustifiable removal of normal tissue; lack of supervision of the clinical work done in the hospital; lack of thorough review on a monthly basis of the clinical work done in the hospital; insufficiently recorded essential entries in clinical records to justify diagnosis and treatment; and, excessively high and unexplained morbidity rates, mortality rates, anesthesia death rates, and unexplained cesarean section rates.

The Joint Commission has been considerably interested in the integration of general practitioners into the hospital staff. The most frequently asked question has been, "Should our hospital have a Department of General Practice?" This depends upon whether the general practitioners are incorporated into the activities of the hospital staff. If they are, if they can and do take part in committee work, hold positions as officers, attend meetings, take part in the clinical sessions and discussion, and if they have an adequate and fair voice in the decisions regarding the affairs of the hospital staff, then there is no value in the development of a Department of General Practice in that hospital.

On the other hand, if the general practitioners do not take an active part on committees, as officers of the staff, if they do not take part in clinical sessions and discussions, if they do not have a voice in the affairs of the hospital (or fair representation), then a Department of General Practice should be developed. The purpose of such a department is to integrate the general practitioners into the hospital staff and to have them share the privileges, opportunities, and responsibilities.

Privileges must be extended to all doctors, general practitioners, and specialists alike, according to training, ability, and experience. This must be done fairly and without prejudice. General practitioners must prove that it is their purpose to strive continuously for the best medical practice both in and out of the hospital. They must be constantly on the alert to avoid being unwittingly drawn into supporting the untrained, the inexperienced, or the incapable.

The greatest problem with regard to the extending of privileges comes in the demands of general practitioners for major surgical privileges. After a Department of General Practice has been formed, the staff almost invariably is willing to approve operative privileges consistent with training, experience, and demonstrated skill. It would seem more advisable for general practitioners to propose the means and devices to control surgical privileges rather than to await the suggestions of another group.

Responsible members of the general practice group want only such privileges for themselves and their colleagues as are justified by skill, training, and experience. They want the patient to be protected against incompetence, ignorance, or inability, whether by specialist or general practitioner, surgeon, or internist. General practitioners request that their skills and training be measured objectively and without bias. They can obtain no greater moral support for their work than the approval of their colleagues. In reality, this approval is one of the most valuable rewards to be gained. Physicians in general practice can do nothing more foolish than to undertake procedures in either the surgical or medical field in which they have been considered unqualified.

Unfortunately, a few physicians have assumed that private patient privileges in the hospital give the holder unlimited power to do as he pleases in the treatment of his patients. This is not so. The medical staff and governing board of the hospital have the responsibility for protecting the public. The mere fact that a man possesses a license to practice medicine does not make him competent in all fields of medicine. On the other hand, lack of certification by a specialty board does not mean that a physician is incapable of doing many of the procedures normally falling under a specialty. In a properly organized hospital, all staff members, specialists, and general practitioners function under rules and regulations designed to enable each physician to hold privileges according to his demonstrated knowledge, training, and ability. Each physician will have an opportunity to advance in privileges when the credentials committee is assured that he is qualified.

In regard to general practitioners now in training, it should be clear that a one-year rotating internship does not fit a man for any but the most minor unsupervised medical, obstetrical, or surgical privileges.

The enlightened person concludes that the continued elevation of medical care in the country requires the closest possible contact of all physicians in a community with the stimulating educational and scientific opportunities and atmosphere of the modern hospital program. The physician finds it impossible to provide modern high standards of medical care for his patients in isolation from the consultants, the laboratories, equipment, and other facilities of the modern hospital. If the general practitioner is to fulfill his place properly in the medical community he must be integrated into the hospital staff. Not until this is done will the hospital fulfill its function of making available the best medical care possible in the community. On the other hand general practitioners fail to fulfill their medical and community obligations if they do not take active part in the staff activities of the hospitals in their community. (GP, Sept., 1954; S. R. Truman, M. D.)

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Hemoptysis in Apparently Inactive Pulmonary Tuberculosis

Does hemoptysis in patients with apparently inactive pulmonary tuberculosis mean relapse of tuberculosis? If not, what other pulmonary diseases are the causes? How frequently is the hemoptysis unexplained? What is the usual outcome? With these questions in mind, the present study was carried out.

The records of 123 patients were examined, 54 men and 69 women. In all of these patients the tuberculosis had been considered inactive for the past 5 to 20 years. Twenty-one, 11 women and 10 men, had hemoptysis. Of the total, in 13 cases the hemoptysis could not be explained. The roentgenologic examination of the chest, sputum examination for tubercle bacilli, and bronchoscopic as well as bronchographic studies, were inconclusive; these patients returned to work within a week or two after the cessation of hemoptysis without subsequent relapse. In only three patients did the hemoptysis mean relapse of tuberculosis.

This study suggests that hemoptysis in individuals having apparently inactive pulmonary tuberculosis does not mean relapse of pulmonary tuberculosis except in rare instances. In the majority of patients it was not possible to explain the cause of hemoptysis. The attacks were not in any way related to exertion, to the menstrual cycle, or to acute respiratory infections. Nevertheless, this symptom should be regarded as potentially dangerous; it is wise for the patient to remain in bed while studies are carried out. The material brought up should be examined by smear, culture, and inoculation for tubercle bacilli. Roentgenograms of the chest will be useful. If the sputum is negative, bronchoscopic examination may be carried out even in the presence of active hemorrhage. The bronchial secretions should be examined for tubercle bacilli as well as for cancer cells. When all examinations are negative and the patient, in the week or two following the cessation of the hemorrhage, has shown no constitutional reaction, his return to normal activity is permissible.

In a given patient the amount of hemorrhage may help in deciding whether the patient has carcinoma, bronchiectasis, or tuberculosis. In bronchogenic carcinoma the amount of blood brought up by the patient is usually small. As a rule the patient brings up blood-streaked, or blood-tinged sputum, without frank hemorrhage. In pulmonary tuberculosis and bronchiectasis, on the other hand, the amount of blood brought up may be massive. It has been suggested by Sokoloff that, when a person with arrested pulmonary tuberculosis develops hemoptysis, bronchiectasis or varicosity of the bronchial blood vessels within the fibrotic lesions may be considered. In patients with what appears to be a single massive pulmonary hemorrhage, if the bronchial lumens are clear and show no signs of recent hemorrhage on bronchoscopic examination, O'Keefe suggests examination of the esophagus for bleeding. At times it may be difficult for

the patient to be certain whether the bleeding was from the lungs or the gastrointestinal tract, particularly if the hemorrhage causes choking. (Ann. Int. Med., Sept., 1954; R. Charr, M. D., Pennsylvania Hospital, Philadelphia)

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Polyvinylpyrrolidone Retention

The search for a plasma substitute suitable for stockpiling has been intensified in recent years. Polyvinylpyrrolidone, or PVP, is one of the three agents under intensive investigation for this purpose. It is an entirely synthetic product which is water-soluble, hydrophilic, and of high molecular weight. Originally introduced in 1943 by Hecht and Weese, it was administered to approximately one-third million German casualties at the Russian front, and a summary of the results of a million infusions with PVP was published in 1951. The effectiveness of this agent as a plasma volume expander in the treatment of shock has been corroborated by many other investigators.

One of the chief potential limitations of PVP has been the demonstration that 35-49% of it is retained indefinitely in the body after intravenous infusion. This report consists of serial observations made on the same group of patients over a follow-up period of 20 months. Included are the preliminary studies carried out on 7 patients who came to necropsy at intervals of 4 to 19 months after the administration of PVP. In evaluating PVP as a plasma substitute suitable for national defense, it is important to determine whether or not the prolonged retention of PVP produces harmful effects on the physiology and structure of organs and tissues in which it has been deposited.

It has been possible to obtain clinical and laboratory data on 23 of the 25 patients originally injected intravenously with 1000 cc. of 3.5% PVP. The data consisted of serial laboratory studies made every 2 to 8 weeks and included complete blood count, hemoglobin level, hematocrit reading, urinalysis, blood urea nitrogen content, phenolsulfonphthalein excretion, and sedimentation rate obtained by the Wintrobe procedure. Various liver function tests were also done. These consisted of determination of sulfobromophthalein (Bromsulphalein) retention, cephalin flocculation, zinc sulfate and thymol turbidity, total serum lipids, serum alkaline phosphatase, and serum bilirubin. In addition to the histologic studies on the interval liver biopsy specimens, autopsy studies have been possible on 7 patients who have died of intercurrent and unrelated causes.

These studies indicate that retention and storage of PVP persist for at least 20 months after intravenous infusion of only 1000 cc. of 3.5% solution. Although many investigators have not found pathological changes in the viscera of animals or human patients after intravenous infusions of PVP, others, such

as Hüsselmann, Schallock, Ammon and Müller, and Grönwall, have described lesions similar to those found by the authors.

The prolonged retention of PVP by the body is unquestionably a disadvantage which must be considered carefully. Because this colloidal substance is not metabolized or broken down into components small enough to permit excretion, storage develops in various organs, particularly in those comprising the so-called reticuloendothelial system.

It is generally considered inadvisable to administer in any quantity medicaments which are stored permanently in important organs or tissues. Their possible effect on the function of those structures, or the production of an inflammatory or foreign body reaction is to be kept in mind.

To date no significant evidence has been found by the authors which indicates that an amount of 1000 cc. of PVP appreciably effects the function of the liver, kidneys, or bone marrow. There is suggestive evidence, however, that slight and transitory impairment of hepatic function occurred in some cases. With considerably larger doses of PVP it is conceivable that serious physiological alterations might occur, but this has not been proved.

Minor inflammatory reactions, presumed to be related to PVP, have been observed by the authors in only 3 cases, but it is noteworthy that the amount of PVP deposited in the liver and other tissues has slowly and progressively increased throughout the study. The findings necessitate continued study of these cases to determine whether or not the retained PVP ultimately causes significant physiological and pathological alterations or whether it is ultimately excreted. If it is shown to cause such alterations, it will be necessary to abandon its use as was the case with other substances previously used for this purpose, such as acacia and pectin. (Arch. Surg., Sept., 1954; W. A. Altemeier, M. D., L. Schiff, M. D., E. A. Gall, M. D., J. Giuseffi, M. D., D. Freiman, M. D., G. Mindrum, M. D., and H. Braunstein, M. D., Cincinnati)

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Long-Term Results from Fenestration

In evaluating the hearing results of the fenestration operation, consideration must be given to: (1) the immediate results in patients properly selected and operated on; (2) the so-called final results after 1 or 2 years, and (3) the results after a period of 5 or more years.

The immediate results in patients, ideally suitable and properly operated on, should be extremely good, that is, the hearing should be improved to a practical and serviceable level in 90% or more of cases. In the 8 or 10% the hearing is not improved and occasionally is made worse. The reasons for the failure of these cases to improve is discussed. Approximately 10% of the immediately successful cases will lose all or part of their improvement within 3 to 12 months after operation. There remains

then about 80% of the ideally suitable patients who retain practical hearing improvement for at least 2 years.

In the cases which will be successful, it has been found that there is considerable improvement of hearing for a day or two following operation but by the second or third day after operation frequently the hearing has receded to well below the preoperative level. This recession appears to be due partly to the reaction of the skin flap overlying the fenestra as a result of the trauma. This reaction of the skin flap and the usual serous labyrinthitis that develops not only depresses the hearing but also suspends the function of the labyrinth. In the great majority of instances this recession of hearing lasts only a few days, and shortly after the gauze packing has been removed the hearing begins to improve and reaches its best point at an average of 3 to 6 weeks after operation. The patient then goes through a period of excellent hearing during the subsequent 8 to 12 weeks; then a period of uncertainty occurs as far as the hearing is concerned.

After the third or fourth month following operation the hearing may do one of three things: (1) remain at its highest level; (2) recede gradually to the preoperative level or below; or (3) recede slightly or moderately to a better than the preoperative level but not as good as the best level attained after operation.

The author's report of the results after 5 or more years is based on a careful study by personal observation and frequent audiograms over a 5 to 8-year period following the fenestration operation on 200 patients. A rather large number of additional patients has been followed for 1 to 4 years after operation, but the results of these cases have not been included in this report, as a period of 5 years following operation has been set as the minimum time in which the results might be designated long-term results. As has been experienced by other operators, the author has found that it is difficult to obtain audiograms over a 5-year period on operated patients. Many patients during such an interval move to a different locality and do not return for a check-up and retesting because they have retained good, serviceable hearing and are satisfied to have it left alone. The author has discovered that a much greater percentage of fenestration patients, who have had an unsuccessful result, will return frequently and for long periods for a follow-up and retesting than those patients who have had a successful result. The latter patients are satisfied and often do not return until their hearing has become depressed and they become alarmed. In such instances, the depressed hearing is usually the result of some temporary condition, such as nasal infection, allergy reaction, or secretory otitis. When patients return at such times as these, the audiograms naturally indicate a reduction of the hearing. In an analysis of statistics on long-term results, the audiograms taken at such times when the hearing is depressed must be discounted if a true estimate of the hearing is to be made. It is difficult to induce many such patients to return for testing when their hearing

has again improved and at a time when a true estimate can be made for comparison with previous tests.

It is the common experience, therefore, that a review of 5-year results will show a rather high percentage of failures among those patients who have returned faithfully for a period of 5 years or more. In analyzing long-term results, therefore, the author has not accepted the audiograms given by patients at a time when their hearing was temporarily depressed, but has insisted on retesting them when this depressed state subsided. Only by careful study and repeated testing can the true hearing be determined in many of these patients.

In reporting the results in these 200 fenestration patients, the audiograms which have been followed for 5 years or more have been separated into 3 groups: (1) 130 patients in whom the operation has been successful, that is, those who have had improvement to the practical hearing level for the three speech frequencies; (2) 49 patients in whom the operation has not been successful, inasmuch as the hearing either was not improved to the practical hearing level or had been satisfactorily improved for a while with later partial loss of the improved hearing; (3) 21 patients in whom the hearing had been improved to a practical level, with subsequent loss of hearing to the preoperative level or below. (The 21 patients had revisions, 45% of which were eventually successful.)

In a study of the results obtained in the first group of 130 successful cases, it is noted that the average hearing 5 years after operation is only 0.5 db. worse than at the end of 1 year. This would appear to indicate that those patients who have retained a satisfactory improvement of hearing for 1 year after operation will retain the hearing without further significant loss for at least 5 years. In an analysis of the results in 43 of the 130 successful cases who had been followed 7 years or longer, there is noted an average 2 db. loss at 5 years over the level at 1 year and a further loss of 1.5 db. in the subsequent 2 years or more. This loss of 3.5 db. over a 7 to 10 year period may or may not be significant. It is noted that the average loss in the 43 cases between the end of the first year and the end of the fifth year is 2 db., while the average loss of the 130 cases (of which the 43 are a part) is only 0.5 db. It is probable that the greater the number of cases in which the hearing is averaged the more accurate will be the estimate of the hearing both before operation and at any period after operation.

In a review of the results shown in the group of 49 unsuccessful cases, it is observed that an average loss of 6.4 db. has occurred between the end of the first and the end of the fifth year. This would appear to indicate that a patient who has not had a successful operation will gradually lose some hearing during the years subsequent to operation. A long-term study of the 21 additional unsuccessful cases cannot be made as all of them were revised from 1 to 3 years after operation.

Several factors concerned in the postoperative hearing are discussed, such as psychological reactions of the patient, inflammatory or allergic conditions of the nose and ears, secretory otitis, presence of tinnitus, emotional and nervous disorders, intralabyrinthine hypertension, auditory nerve degeneration, and further advancement of the otosclerotic process. (Arch. Otolaryng., Sept., 1954; E. H. Campbell, M. D., Graduate School of Medicine, University of Pennsylvania, Philadelphia)

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Facial Nerve Paresis in Parotid Surgery

In operations on the parotid gland, the facial nerve presents a stumbling block to the successful consummation of the surgery. In order to avoid permanent injury to this structure, it is necessary to expose more or less of the facial nerve in every operation. Invariably such exposure will result in some degree of paresis. This may be so mild that only on very careful examination with the mouth wide open will the weakness of the more commonly involved lower lip be noted. Usually the paresis is extensive enough to be easily evident, and often it may involve the entire area of facial nerve distribution.

Of 153 cases of parotid surgery, in 147 the surgery included the deliberate exposure and dissection of the facial nerve. In this latter group some degree of facial nerve paresis resulted in all cases. Ninety-six of these cases were available for study. Twenty-three cases, in which some degree of paresis is still present, were not included in this analysis because it is thought that at least two years must elapse before a persistent paresis can be considered to be permanent. Another group of 34 cases, with preoperative paralysis due to previous surgery or disease, was excluded because a proper differentiation of any additional paresis could not be comparatively analyzed. This latter group will be separately studied.

The purpose of the study of these 96 cases was to determine what percentage of patients developed temporary paralysis of the facial nerve and to correlate the degree and extent of this paresis with the position of the lesion, the extent of the surgery, the extent of exposure of the facial nerve, the age of the patient, and the type of lesion, particularly with respect to its infiltrative or well-defined characteristics. The mode of recovery was also studied and correlated with the various factors. Regardless of whether the paralysis appeared to be complete or not, it was considered to be a complication of paresis because there was no evidence at surgery of solution of continuity of the facial nerve in this group of cases.

Some degree of paresis will appear in practically all cases of exposure of the facial nerve. This paresis is about 50% complete in 2 hours,

75% in 24 hours, and reaches its maximum in 48 hours. It usually appears first in the lower lip, then in the upper lip, forehead, and eyelids, and as a rule, disappears in opposite sequence. The lower lip is earlier, more often, and more severely involved.

The extent and degree of the paresis and the delay in recovery are in almost direct proportion to the extent of exposure of the facial nerve. The latter depends on the extent of the surgery which, in turn, is most often related to the location of the lesion.

Everything else being more or less comparable, patients under 40 years of age have less paresis and recover more quickly than those over 40 years. If no nerve has been severed recovery in from 1 day to 2 years may be anticipated in all cases regardless of the severity of the paresis or the age of the patient.

Recovery from the paresis occurred in all cases discussed without the aid of electrotherapy. (Surgery, Oct., 1954; S. L. Perzik, M. D., Beverly Hills, Calif.)

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Occlusive Disease of the Aorta

Arteriosclerotic occlusive or thrombo-obliterative disease of the terminal aorta, also termed insidious thrombosis of the aorta, chronic aorto-iliac thrombosis, or Lerich's syndrome, has been generally considered a relatively uncommon disease.

Until recently therapy consisted of lumbar sympathectomy or, in addition, resection of the involved segment of aorta. The former procedure was directed toward increasing collateral blood flow, while the latter was designed to prevent propagation of the thrombotic process. Although these measures may result in some symptomatic improvement, they are not entirely satisfactory, being essentially palliative in nature.

More recently, attention has been directed toward restoration of vascular continuity and normal blood flow. To achieve this objective, Wylie and associates have advocated the procedure of thromboendarterectomy, consisting essentially in opening the occluded vessel and removing the arteriosclerotic obliterative process, following which the vessel wall is repaired by suture. This procedure has yielded satisfactory results in some instances, but in the experience of the authors it has been found to have limited application, owing to the fact that the mural arteriosclerotic changes which have usually been encountered about the bifurcation have been so extensive and destructive as to preclude its use. For these reasons the authors have directed their efforts toward extirpation of the diseased segment with restoration of continuity by aortic homograft, as originally conceived by Leriche approximately 30 years ago, in the belief that this provides a more effective approach to the problem.

This report is concerned with observations made on 22 patients with thrombo-obliterative disease of the aorta treated by resection of the aortic bifurcation and replacement with a lyophilized aortic homograft. Ten patients had a localized occlusive process, and 12 had partial aortic occlusion. All were white males ranging in age from 33 to 63 years, with an average age of 49. Those with complete occlusion were almost a decade younger than those with incomplete occlusion. The clinical manifestations consisted essentially of slowly progressive symptoms of arterial insufficiency of the lower extremities, in addition to sexual impotence and hypertension in about one-third of the cases. The average duration of symptoms for those with complete occlusion was four and one-half years, and for the group with incomplete occlusion, two and one-half years. Aortography confirmed the clinical impression in the cases with complete aortic occlusion and established the presence and extent of the partial occlusive process.

Aortic bifurcation homografts were implanted in all patients. In addition, homografts were placed in the iliac bifurcation in 4 cases, in the external iliac artery in 3 cases, in the common femoral artery in 2 cases, and in the superficial femoral artery in 1 case.

On the basis of pathologic studies, the resected specimens were classified into two groups--those with complete occlusion and those with partial occlusion. The gross and histologic appearance of the vessel wall and of the occluding thrombi suggest that the thrombo-obliterative process begins in the common iliac arteries and in the region of the aortic bifurcation, and involves more proximal segments by propagation.

Two deaths occurred in the series of cases under discussion. All but 4 of the remaining patients have experienced striking improvement, with complete restoration of pulses in the lower extremities.

On the basis of observations made it appears that the complete occlusion form of thrombo-obliterative disease is generally confined to the terminal aorta and bifurcation, and is ideally suited for resection with homograft replacement. On the other hand, the partially occluded process tends to be much less localized, and when associated with peripheral arteriosclerosis obliterans, the procedure of aortic resection and homograft replacement may be contraindicated. (Ann. Surg., Sept., 1954; M. E. DeBakey, M. D., O. Creech, Jr., M. D., and D. A. Cooley, M. D., Houston, Texas)

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Oral Calcium EDTA in Lead Intoxication

The use of disodium calcium ethylenediaminetetraacetate (CaEDTA), an organic chelating agent, has been reported in the treatment of lead intoxication. The ability of the agent to chelate lead, the ready excretion of water-soluble chelates and the absence of toxic effects because of the nonionizable

stable complex formed with lead prompted the use of CaEDTA in this field. The present study reports the effect of oral CaEDTA used alone on 5 cases of chronic lead intoxication in children.

Children with a documented history of eating paint and/or plaster of a toxic lead content were selected. Confirmation of lead intoxication was determined through blood lead levels, roentgenograms of the long bones, urinary coproporphyrins, and hemograms. All patients were hospitalized during the study period in the University of Maryland Hospital.

The use of oral CaEDTA given to the 5 patients with proved lead intoxication produced a marked increase in urinary lead excretion. The drug was well-tolerated and brought about disappearance of symptoms of anorexia and irritability. Initial elevated blood lead values were lowered following treatment in all 5 patients. Changes in the T waves, which were noted in 4 of the 5 patients during treatment, disappeared upon discontinuance of the drug. The significance of these changes is not known at the present time.

The amount of urinary lead excreted following oral CaEDTA is much less than that which follows intravenous CaEDTA. This suggests that, in acute lead intoxication and in lead encephalopathy where it is necessary to obtain a rapid excretion of lead, the intravenous route should be employed. However, oral CaEDTA may eventually prove of supplementary value and at the present time offers some promise as an agent in the treatment of chronic lead poisoning. Final dosage, frequency and duration of treatment remain to be determined. (J. Pediat., Sept., 1954; J. E. Bradley, M. D., and A. M. Powell, Jr., M. D., Baltimore, Md.)

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Leukoplakia of Renal Pelvis and Ureter

Leukoplakia is a metaplastic change in the urinary tract in which the normal transitional epithelium is changed into the squamous or skin-like type, characterized by keratinization and almost always by desquamation. Writers generally agree that the lesion is precancerous.

The cause of leukoplakia is unknown. Undoubtedly the most widely accepted explanation is that leukoplakia of the urinary tract is a true metaplasia arising as the result of chronic inflammation and irritation, and is the biological process of adaptation to environment in the form of protective cornification. In the study of a larger series of cases, two uniform observations were made: (1) Pyuria is present in all cases. (2) Leukoplakia usually occurs concomitantly with other diseases. It is suggested that leukoplakia may be secondary to severe chronic infection, calculous or neoplastic disease, or urinary tract obstruction. It is no longer believed that it is a manifestation of syphilis. While there once appeared to be laboratory evidence that a lack of vitamin A was causative, this view seems to have been abandoned.

The disease occurs most commonly in the age group between 30 and 50 years. There are few patients under 20 although occasional cases have been reported in childhood and in extreme old age. The condition is found about twice as often in the male as in the female.

There are no symptoms typical or characteristic of this condition except, as a rule, those of the coexisting disease. Frequency, urgency, dysuria, hematuria--any or all may be present. The outstanding finding noted by several authors is the discovery of cornified epithelium in the urinary sediment. This is described by Senger, Bottone, and Kelleher as the passage of "gritty flakes in the urine." It is also mentioned by Laughlin and Bilotta, and Arnholdt considers it pathognomonic, though he points out that the disease may exist without this finding.

The difficulty in preoperative diagnosis is evidenced in the cases reported. Subjective symptoms are of little value, and the finding of large amounts of squamous epithelium in the urinary sediment must be emphasized as the one important objective clue. This observation should suggest leukoplakia at once.

Pyelo-ureterographic findings are certainly not diagnostic in this disease and are only of general value.

Leukoplakia in the upper urinary tract must be differentiated from tuberculosis, neoplastic disease (either squamous or transitional in type), calculosis, severe pyogenic pyelonephritis, pyelitis, ureteritis cystica, and glandularis.

The treatment of leukoplakia involving the kidney and ureter is preferably ureteronephrectomy, both to remove the potential malignancy and to relieve the symptoms. Fortunately, in less than 5% of the patients the condition has been bilateral and only conservative palliative measures could be instituted. In the light of present knowledge such therapy must be directed toward control of infection and promotion of free drainage. (J. Urol., Sept.1954; C.C. Falk, Eureka, Calif.)

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Traumatic Rupture of the Kidney

The care of patients with traumatic rupture of the kidney has been and continues to be a controversial subject in urology. Difference of opinion exists both with regard to the method and extent of the radiological investigation necessary for an understanding of the case and as to the form of treatment to be used--conservative non-operative measures or surgery.

With these questions in mind, particularly that of the extent of the radiological investigation, a review was made of 17 cases of traumatic rupture of the kidney seen in the Toronto General Hospital, 1947 to 1953. X-ray examination included anteroposterior views of the abdomen, intravenous pyelography, and retrograde pyelography.

A plain film of the abdomen may show loss of the kidney shadow or its enlargement, obliteration of the psoas muscle, scoliosis with concavity to the affected side, fractures, et cetera. The examination is harmless so far as the patient's general condition is concerned, but unfortunately, it does not often give much information because of overlying gas-filled bowel, the result of a paralytic ileus.

Excretory pyelograms are without danger so far as infection is concerned. They are easily obtained and offer valuable information in the majority of cases. They are best done on admission, though at that time failure of function on the injured side may be apparent. A few days later, however, a repeat examination may be satisfactory. The injured kidney may show extravasation of the medium into the parenchyma of varying degree according to the extent of the injury sustained. Deformity of the calyces, pelvis, or ureter may be seen, the result either of blood clot within or of pressure from without by an extrarenal mass. From the point of view of determining the treatment to be carried out, it is of great importance that the condition of the non-injured kidney be observed.

That cystoscopic examination and retrograde pyelography should be routine procedures is the opinion of certain writers. They contend that a much better pyelogram is obtained, and that extravasation, when present, is much more apparent than on the intravenous study. Opponents of retrograde pyelography maintain that it carries with it the danger of introducing infection and of increasing or reactivating bleeding. Its advocates reply that not only are these dangers more theoretical than real, but also that even if the method is in truth accompanied by these hazards they are more than offset by the danger that may result from mismanagement of the case if the examination is not used.

In 9 of the 17 cases studied, intravenous pyelograms were obtained and 8 of these gave valuable information. Two of the 8 revealed only nonfunction on the injured side. In 5 of the cases in which intravenous pyelography was done, retrograde pyelograms were also obtained, and in 2 cases these furnished additional information with regard to the condition of the kidney.

The 17 cases revealed that 23% of the total number of patients with traumatic rupture of the kidney showed also pre-existing renal disease, of which there had been no knowledge on admission. The conditions encountered included cysts, malignant tumors, hydronephrosis, and calculi. (Radiology, Aug., 1954; M. R. Hall, M. D., Toronto General Hospital, Toronto, Canada)

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Navy Chaplain School, New Program

Eleven "probationary ensigns" recently reported to the Chaplain School of Indoctrination, Schools Command, U. S. Naval Base, Newport, R. I., for training in a new program which began on 1 July 1954. They graduated on 26 August 1954 as the first group of "probationary ensigns." These men completed their college work and had two years of theological schooling but will require a third and final year of seminary study.

These ensigns are taking the same indoctrination course now given to all newly procured Lieutenant (jg) chaplains. They are attending classes with the 26 LTJG Chaplains who are currently at the school. Ensigns taking the training have signed up in the Naval Reserve for the eight-week period of active duty and are receiving full pay and allowances as ensigns. They are in a probationary status and will not officially join the Corps of Chaplains, with the rank of lieutenant (jg) until they complete their seminary work next year and are ordained in the respective denominations.

Those participating in this training program have committed themselves to stay in the Reserve program for eight years after ordination if the commission is offered. There is no obligation on the part of the trainee to volunteer for active duty after ordination. It is expected, however, that some will desire active duty. Those not electing active duty will be placed in the Ready Reserve.

In creating the new program, the Navy has sought to augment its pool of Reserve chaplains. These men could be brought to active duty without further training in case of mobilization. It is anticipated that the "probationers" will gain a thorough understanding of the mission of the Navy chaplain, which they in turn will be able to share with their fellow seminarians when they go back to their senior year at the theological seminary in the fall. These ensigns will also find out whether they are better suited for the challenge of Navy life or of a civilian parish.

This program is of real benefit. Having undergone the courses of study at the school, the trainees become accustomed to Navy life. They board ships and submarines and sail on a destroyer for a day. On Sundays they hold worship services on board ship in crew's messes or in libraries on larger ships. They meet and mingle with bluejackets. They sense the mission of a chaplain who serves the Navy both at sea and ashore.

One ensign probationary made the remark that, having met Navy men face to face and having studied at the Chaplain School, he was returning to the Seminary determined to shorten his sermons, make understandable to ordinary people his doctrine, and make his ministry alive and personal for those he served.

This being the first group to attend the Chaplain School as ensigns, it is not yet possible to forecast the long-term effect on the Reserve chaplain program, or how the opportunity to seminarians helps in a clergyman's

desire to serve as an effective representative of his church as a Navy chaplain. One far-reaching effect is certain. The "ensign probationary" discovered that clergymen at the school of all denominations lived and worked and played together. The Chaplain Corps' motto became a working concept for him, "Cooperation without Compromise." (Chaplain H. W. Austin, Naval Training Bulletin, NavPers, Sept., 1954)

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Semiburied Denture Implants: Review of Literature and Experimental Study

In spite of advances in dental prosthetic technic, there are many patients for whom it is almost impossible to construct a satisfactory lower denture.

In the search for a method to provide positive retention of the mandibular denture, there has been a revival of a surgical-prosthetic procedure involving the subperiosteal attachment of an inert metal appliance to the bony alveolar ridge. The appliance has several abutments which extend through the alveolar soft tissues into the oral cavity, and which are utilized in the place of abutment teeth to provide necessary retention and stability for a mandibular denture. The combination of subperiosteal metal splints and a tooth-bearing denture is known as an "implant denture."

While these implant dentures are well designed mechanically, nonetheless they violate a fundamental surgical principle, i. e., that the continuity of epithelial surfaces must be maintained. Any defect in epithelial continuity constitutes an abnormal situation which the living organism must combat until the defect is eliminated.

The literature was reviewed on the subject of various metallic semiburied implants.

An investigation on experimental animals was carried out to determine the relationship which develops between metal and epithelium in the regions where implant abutments pass through alveolar soft tissues into the mouth. Six Vitallium implants were inserted into oral tissue of four dogs 16 weeks after the removal of all the teeth in one quadrant. The Vitallium implants were constructed, using the direct impression technic. In 5 cases screws were used to provide temporary retention, but in every case the alveolar mucosa failed to heal over the screws. One case of circumferential wiring was used. After varying periods of time ranging from 2 to 5 months, the implants and surrounding tissues were removed in bloc and histologic sections prepared.

In these experiments, it appeared that there was not a tight mechanical seal between the metal and the tissue. In every case, the implants, which had originally been placed directly on the bone surface, 2 to 5 months later were found to be resting on a layer of dense fibrous connective tissue.

Histologic sections demonstrated that in the case of semiburied implants, oral epithelium slowly insinuates itself between the metal and underlying connective tissue, suggesting that eventually the implant would no longer be semiburied but instead would be merely resting in an epithelium-lined pocket.

The epithelial cells were shown to migrate down between the implant abutments and the surrounding connective tissues with no apparent evidence of attachment between the epithelium and the metal. There also was massive inflammatory infiltration of epithelium and connective tissue in regions adjacent to the implant abutments.

It is concluded that all factors involved seemed to indicate an attempt on the part of the host tissues to reject the implant as a foreign body; not because any irritation is caused by the metal itself, but rather because the presence of the abutments creates an abnormal break in the continuity of the protecting epithelium.

Therefore, the results of this study do not support the current practice of utilizing the semiburied implant in denture construction. A re-evaluation of implant denture technic and its indication for use is suggested. (J. Oral Surg., July 1954; F.C. Nichols, D.D.S., St. Petersburg, Fla.)

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From the Note Book

1. Rear Admiral Lamont Pugh, MC USN, the Surgeon General, addressed the opening session of the Fifth Annual Military Medico-Dental Symposium held at the Naval Hospital, Philadelphia, Pa., October 18-23, 1954. His subject was "Matters of Concern." (TIO, BuMed)

2. Rear Admiral B. W. Hogan, MC USN, Deputy and Assistant Chief of the Bureau of Medicine and Surgery, was recently honored by being elected a Delegate-at-Large of the House of Delegates, American Hospital Association. (TIO, BuMed)

3. Rear Admiral D. W. Ryan, DC USN, Assistant Chief for Dentistry and Chief of the Dental Division, Bureau of Medicine and Surgery, and Captain G. L. Parke, DC USN, Force Dental Officer, CINCNELM, have recently been appointed to serve as co-opted members of the Armed Forces Services Commission of the Federation Dentaire Internationale. (TIO, BuMed)

4. On October 4, 1954, Mr. Loren B. Poush, Legal Assistant to the Surgeon General, and Commander R. R. Rambo, MC USN, Personnel Division, Bureau of Medicine and Surgery, were admitted to practice before the Supreme Court of the United States. (TIO, BuMed)

5. The Office of Naval Research, Washington, D. C., was host to Major General Rodolfo Sanchez Taboada, Secretary of Marine of the Republic of Mexico, Tuesday, October 5.

In planning a trip to this country, 4-17 October, as a guest of the United States Navy, General Sanchez expressed an interest in a presentation of the Navy's research program in hydrobiology. In addition to his naval duties, General Sanchez is responsible for the Mexican merchant marine, fisheries, and other maritime matters. (TIO, ONR)

6. The Fifth Annual Military-Medico-Dental Symposium for all the Armed Forces of the United States convened at the Naval Hospital, Philadelphia, Pa., October 18-23, 1954, under the sponsorhsip of the Commandant, Fourth Naval District. Rear Admiral Lamont Pugh, MC USN, the Surgeon General, and the Honorable Edward Martin, United States Senator from Pennsylvania, were the guest speakers of the day at the opening session. (TIO, BuMed)

7. A revision of the booklet, Immunization Information for International Travel, giving the latest facts on immunizations needed by travelers going to every part of the world has just been released by the Public Health Service of the Department of Health, Education, and Welfare. The booklet contains official information on the immunizations required by each country as well as the immunizations recommended by the Public Health Service as precautionary measures for persons traveling abroad.

8. Radioactive-Waste Disposal in the Ocean, National Bureau of Standards Handbook 58, 31 pages.

The ever-increasing production and use of radioactive isotopes has raised numerous questions concerning their handling, transportation, and ultimate disposal. It appears that the sea may be an appropriate place for the disposal of intermediate and large amounts of isotopes having long half-lives (more than 1 year) or high radiotoxicity. It is the purpose of this Handbook to bring to the attention of those concerned, the many different factors that should be taken into account when radioactive wastes are to be dumped into the ocean, and to make recommendations for the proper use of this disposal method. (National Bureau of Standards)

9. Nearly 400,000 nurses--an increase of 16,000 since 1950--are now working in the United States. Estimates based on the latest available figures from the 48 States and District of Columbia, show a total of 389,600 professional nurses in active practice in the nation. However, the demand for nursing services is so great that the present recruitment goal for the nation as a whole is 55,000 student nurses a year. (P. H. S., H. E. W.)

10. The Journal of the American Medical Association, October 9, 1954, page 607, carries a report of the Committee on Pesticides on the abuse of insecticide fumigating devices. This report re-emphasized previous committee warnings about the indiscriminate use of insecticide volatilizing devices in the home, and presents new evidence of the harm resulting from the highly questionable tactics used to promote the sale of these devices.

11. The results obtained from the use of the Polaroid Color-Translating Ultra Violet Microscope have been so promising that several instruments will soon be in operation in medical and biological laboratories. (Research Reviews, ONR, Sept., 1954; M. N. Swaffield)

12. Gastrointestinal allergy in infants is described in terms of the clinical syndrome which occurs. Methods of diagnosis, the criteria of a definite diagnosis and the treatment are also reviewed. (J. Pediat., Sept., 1954; C. Collins-Williams, M. D.)

13. Study of patients with proved Hodgkin's disease with short and long survival periods showed that clinically detectable factors such as age, sex, race color, marital status, family status, history, extent of disease symptoms, physical examination, and laboratory aids are not reliable prognostic signs. Despite such unfavorable signs as generalized disease, conctitutional symptoms, Hodgkin's sarcoma or abnormal blood picture, carefully planned therapy, persistently pursued may result in prolonged survival. (J. AMA., 2 Oct 1954; J. W. Finkbeiner, M. D., L. F. Craver, M. D., and H. D. Diamond, M. D.)

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Recent Research Reports

Naval Medical Research Unit No. 3, Cairo, Egypt

1. Ixodes Hoogstraali, New Species, Tick from Yemen, NM 005 050. 39. 34.
2. Studies in Shigellosis. The Relationship of Age to the Incidence of Shigella Infections in Egyptian Children, with Special Reference to Shigellosis in the Newborn and Infants in the First Six Months of Life. NM 005 083. 07. 06

3. Notes on African Haemaphysalis Ticks. The Mediterranean-Littoral Hedgehog Parasite H. Erinacei Pavesi. NM 005 050. 29. 08.
4. Amebiasis. Controlled Linear Studies of Non-Dysenteric and Mild Hepatic Forms in Egyptians. NM 007 082. 20. 04.
5. Two New Fleas of the Genus Araeopsylla Jordan and Rothschild. NM 005 050. 39. 36.

Naval Medical Research Unit No. 4, NTC, Great Lakes, Ill.

1. The Prophylaxis of Streptococcal Infections with Oral Penicillin. A Report on Mass Prophylaxis Studies at U. S. Naval Training Center, Bainbridge, Md., 1953. NM 005 051. 18. 01.
2. Further Studies on the Prophylaxis of Streptococcal Infections with Oral Penicillin. NM 005 051. 15. 02, 7 June 1954.
3. Antibiotic Treatment of Streptococcal Exudative Tonsillitis or Pharyngitis in Navy Recruit. NM 005 051. 10. 02, 17 June 1954.
4. Studies on Influenza B Viruses Isolated from Navy Recruits in the Spring of 1954. NM 005 051. 06. 05, 30 June 1954.
5. A Method for Determining the antistreptolysin O Titer Using Capillary Blood. NM 005 051. 14. 10, 14 April 1954.

Naval Dental Research, NTC, Great Lakes, Ill.

1. The Relationship Between Salivary Phosphatases, Caries Activity, and Oral Streptococci in humans. NM 008 013. 12. 03, August 1954.

Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. Preliminary Studies on the Inhibition of Metabolic Reactivation. NM 005 052. 27. 06, July 1954.

National Academy of Sciences, National Research Council, Division of Medical Sciences.

1. Safe Handling of Pesticides Employed in Public Health, 8 June 1954.

Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn.

1. A Progress Report on Hypoglycemia and Cochlear Microphonics. NM 002 015. 15. 01, 28 June 1954.
2. Report on Pre-Production Samples of Dark Adaptation Glasses. NM 002 014. 08. 07, 20 July 1954.
3. Visual Characteristics of the Submarine Population. NM 003 041. 57. 02, 20 July 1954.

Naval Medical Research Institute, NNMC, Bethesda, Md.

1. In Vivo Measurement of Body Fat and Body Water in a Group of Normal Men. NM 004 006. 03. 08, 10 March 1954.

2. The Metabolism of Injected Radioactive Glutathione (S^{35}) in X-Irradiated and Non-Irradiated Mice. NM 006 012.05, 22 Mar 1954.
3. The Composition of Skin as Compared with Muscle. NM 007 081.16.01, 22 Apr 1954.
4. Transfers of Water and Electrolytes Between Skin and Extracellular Fluid Following Extensive Experimental Flash Burns. NM 007 081.16.02, 22 Apr 1954.
5. A High-Impedance Input Circuit Suitable for Electrophysiological Recording from Micropipette Electrodes. NM 000 019.03.01, 22 Apr 1954.
6. Similarities Between Schizongony Sporogony in Plasmodium. NM 005 048.01.08, 30 Apr 1954.
7. Some Recent Investigations in Photodosimetric Technique. NM 000 018.07, 4 May 1954.
8. Altered Proportions of Isotopes of Molecular Nitrogen as Evidence for a Monomolecular Reaction. NM 000 018.07, 7 May 1954.
9. Developmental Study of the Use of Vycor Glass for Gamma Ray Dosimetry. NM 006 012.04.69, 17 May 1954.
10. Glass Apparatus Improvements. NM 000 018.07, 25 May 1954.
11. Studies on Pathogenesis and Immunity in Lymphocytic Choriomeningitis Infection of the Mouse. NM 005 048.14.01, 27 May 1954.
12. The Influence of Simulated Mutilation upon the Perception of the Human Figure. NM 004 008.04.02, 3 June 1954.
13. The Calibration of Gamma Emitting Radioisotopes in Terms of Ionization Produced. NM 006 012.04.71, 16 June 1954.
14. The Effect of Age and Sex Ratio on the Mating Activity of Anopheles Quadrimaculatus Say. NM 005 048.06.06, 22 June 1954.

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BUMED INSTRUCTION 6710.7B 30 September 1954

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical/Hospital Corps Personnel Regularly Assigned

Subj: Yellow fever vaccine; procurement of

Ref: (a) BUMEDINST 4220.2A
(b) BUMEDINST 6230.1
(c) Art. 22-25, ManMedDept

This instruction sets forth the procedures to be used in the procurement of yellow fever vaccine, and redesignates the yellow fever stocking points. BuMed Instruction 6710.7A is canceled.

BUMED NOTICE 1520 7 October 1954

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Officers of the Medical Service Corps and Hospital Corps Regularly Assigned

Subj: Training available to officers of the Medical Service Corps and Hospital Corps

Ref: (a) BUMEDINST 1520.7

Encl: (1) Table of Training

This Notice provides information regarding training available to Regular Navy officers of the Medical Service Corps and the Hospital Corps.

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AVIATION MEDICINE DIVISION

Hypoxia . . . . . ?

"I was flying an F-86 at 30,000 feet in my first close formation flight. Looking back upon it, I can recall that I was apprehensive, but who wouldn't have been. The experience is a bit hazy, but I was probably breathing a bit faster than normal. I was on oxygen and the oxygen supply was checked at 400 pounds per square inch with normal blinker function prior to take-off. About 15 minutes after leveling off at 30,000 feet, I began to notice difficulty in maintaining my proper distance and position in formation. I felt slightly hot, my stomach felt upset, and my thinking was slow. My oxygen was checked and everything was found to be normal--the blinker was

working, oxygen connection was secure, and my fingernails appeared a normal color. Of course, all of these details are not clear, but I think what I am saying is correct. As nearly as I can remember, it was at this point that I began to become weak, dizzy, and a little faint. I do remember perspiring excessively, and particularly that my palms were wet enough to cause my hands to become slippery. Oh yes, and my vision was slightly blurred. I'm not at all sure about this next point, but very vaguely I recall a sensation of numbness and tingling all over my body, most pronounced in my hands. It was extremely difficult to think, but as evidenced by the oxygen regulator control after landing, I must have switched the regulator to 100% oxygen. I attempted to contact my instructor and although I heard voices, I could not understand what was being said. The next thing I recall is going into a dive, and some time later attempting to correct the plane's attitude with relation to a cloud. After accomplishing level flight, the altimeter indicated an altitude of 2500 feet. I was still uncomfortable, dazed, and dizzy. While returning to the base, I heard the instructor state that I had dived into the ground. This shocking statement seemed to revive me somewhat. I contacted base, and had to reaffirm my identification and advised the tower that I was heading home. I landed sloppily but safely, but let me tell you that was the most difficult approach and landing I have ever made. After stopping the aircraft, my senses were still clouded, and I was slightly dizzy. Only after about three hours at ground level did I feel completely normal. I might state that I have experienced hypoxia, both during actual flight and in the altitude chamber, and that this episode was different."

This case report is not entirely fact but is based largely upon an actual experience, and is intended to stimulate more thought prior to attributing an untoward incident at altitude to hypoxia. This article is by no means intended to minimize the significance of hypoxia or the frequency of its occurrence, but is intended to re-emphasize the possible significance of other causes of physiological mishaps during flight.

The Air Force is experiencing a large number of unexplained aircraft accidents, and hypoxia incidents (near accidents). The possibility exists that the adverse physiological effects of such factors as hypoxia, hyperventilation, emotional and/or vasomotor instability, and toxic agents have contributed to these unexplained accidents. In addition, in the case of hypoxia incidents, it is possible that some of these incidents could have been actually attributed to the hyperventilation syndrome, either primary or secondary to hypoxia. Of the above-mentioned possible causative or contributory factors, the hyperventilation syndrome stands out as a significant factor in need of re-emphasis.

For many years clinicians have recognized that hyperventilation can produce certain symptoms and that these symptoms can be reproduced within a minute or so by voluntary forced breathing. Within about 30-60 seconds

of extreme hyperventilation, the symptoms of dizziness, instability, and faintness will appear, and if continued, a sensation of numbness and tingling in the extremities will result. In addition, the following symptoms are often noted: blurring of vision, inability to think clearly, apprehension, tenseness of the muscles, and eventually, tetanic contractions of the muscles may develop, especially in the hands with the fingers in the characteristic position of "carpo-pedal spasm." If hyperventilation is continued long enough to produce carpo-pedal spasm, vasomotor disturbances may develop resulting in pallor, perspiration, increased pulse rate and cyanosis, and unusually susceptible individuals may lose consciousness.

It was mentioned previously that some incidences of reported hypoxia actually may have been incidents of hyperventilation. This possibility is feasible because of the similarity between early symptoms of these two conditions, particularly to the untrained person. Dizziness, faulty vision, depressed cerebration, and sensory dullness are often symptoms of both hypoxia and hyperventilation. Hypoxia causes hyperpnea, and hyperpnea can result in hyperventilation and whether or not the hyperpnea is the cause or effect can be extremely confusing. It should be remembered that the more advanced symptoms of numbness, tingling, muscle spasm, and tetany are common only with hyperventilation, and may serve as points for differentiation. It is extremely important that the similarity between the subjective responses to hypoxia and hyperventilation be brought to the attention of aircrews, for hyperventilation erroneously self-diagnosed as hypoxia may result in faulty corrective action, namely, increased ventilation which would, of course, be adding insult to injury.

The initiating factors and physiological mechanisms responsible for the symptoms of hyperventilation have been extensively studied, but complete understanding remains to be accomplished. Generally speaking, hyperventilation is a disturbance of respiration as a result of emotional tension or anxiety and may be accentuated by oxygen want, and often remains unrecognized because the subject is usually unaware of his abnormal respiration. Even though the hyperventilation syndrome has been of interest to the clinician for many years, only recently has its significant relationship been evident by the admitting of pilots that instances of hyperventilation occur during flight when the pilots are exposed to stressful situations. In addition to anxiety and hypoxia as initiating factors, breathing under pressure in itself can result in hyperventilation. As a result of hyperventilation, increased amounts of carbon dioxide are expired, which in turn reduces the stimulus to the respiratory center in the brain. Normally, the breathing amplitude and rate diminish until a normal carbon dioxide concentration is restored; however, under the influence of apprehension or the suspicion of hypoxia, the individual continues to overventilate. As a consequence, the acid-base balance of the blood is disturbed, resulting in alkalosis which in turn further disturbs other biochemical homeostatic mechanisms. Without going into great detail for the purpose of this article it is sufficient to say

that a resulting derangement of calcium is probably responsible for the development of tetany. One additional physiological factor of significance should be mentioned, namely, the "Bohr phenomenon"--excessive loss of carbon dioxide interferes with the dissociation of oxygen from oxyhemoglobin. When there is a decrease in the carbon dioxide content of the blood, there is a shift of the oxygen dissociation curve of hemoglobin to the left, with the result that oxyhemoglobin does not release an equal volume of oxygen to the tissues at as high a partial pressure as it would normally. Therefore, tissue hypoxia can occur, though the oxygen content of arterial blood is normal.

An extreme degree of hyperventilation is not necessary to produce this syndrome. Studies have been carried out on a more prolonged and milder type of overbreathing, as would be more likely to occur during flights. In one such study, a group of subjects merely doubled the rate and amplitude of respiration. Out of 10 subjects, 4 developed only mild symptoms after 20 to 25 minutes, but 2 of the pilots became unconscious and for several minutes after discontinuance of the experiment appeared to be in a serious condition, so that they surely would have been unable to control an airplane had such a state occurred when in flight. Also, experiments designed to test one's ability to perform rapid and accurate movements of the hands before and after hyperventilation revealed that an increased amount of time was required after hyperventilation.

The hyperventilation syndrome may be far more important in aviation than generally appreciated. In flying mishaps where there is a suspicion that a physiological disturbance has been a factor, the possibility of hyperventilation must be borne in mind. (U. S. Air Force Medical Service, Apr., 1954)

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G-Suit Inflation, Comments Concerning

Some questions have been raised by the article of Lt F. H. Austin, Jr. (MC) USN, in his study on G-suit inflation which appeared, Vol. 23, No. 12 of the News Letter. It is, therefore, considered desirable to comment on the article, provide additional information, and emphasize certain points and conclusions.

First of all, it should be said, that the Navy greatly needs many more flight surgeons with the interest, curiosity, and initiative shown by Dr. Austin. One of the best and earliest methods of establishing rapport with an air group or squadron or any pilots is for the flight surgeon to demonstrate a knowledge of, and interest in, the problems of aeromedical safety and survival equipment, and thereby to practice preventive aviation medicine. It is appreciated that the shortage of doctors makes the demands

on medical officers all the greater, but it doesn't take great amounts of time to read the technical notes and information on such items as oxygen and anti-"g" equipment, ejection seats, shoulder harnesses and lap belt equipment, and other safety and survival equipment. A few minutes with each pilot, when the pilot, or flight surgeon first joins a squadron, fitting an oxygen mask, checking an anti-g suit or protective helmet fit, or checking the pilot's familiarity with and expeditious accomplishment of pre-ejection and ejection maneuvers, can save lives as positively as performing appendectomies or treating pneumonia, though possibly less dramatically or immediately. This preventive aspect of aviation medical practice is most important, yet it is one that is most often neglected because we rationalize that we are physicians not engineers, and so we don't spend time studying and reading up on the information regarding these equipments and the physiological factors involved.

It may be said that this equipment involves pilots, engineers, and physiologists (or flight surgeons). Of the three groups, the flight surgeon is the best common denominator, and in any case has more of the essential knowledge and understanding of physiological matters and human tolerances. Dr. Austin is therefore to be congratulated for his efforts and studies which have increased his knowledge of this type of equipment, and his article which it is hoped has increased the interest and awareness of a "need-to-know" in other flight surgeons. It is hoped that all of us will make greater efforts to acquire more knowledge of aeromedical safety equipment and will apply this in working with pilots, so that accident rates and loss of lives along with tremendous costs from damaged and destroyed aircraft can be reduced.

However, it is considered that the article tends to overemphasize the dangers of anti-g equipment malfunction.

It is known that occasional instances of malfunction have occurred, particularly in the days when this equipment was first installed some ten years ago. At that time in the propellor-type aircraft the anti-g kits were installed in the field and in some instances the pressure lines were hooked up incorrectly and the g-valves filled with oil from the oil separator on the exhaust side of the vacuum pump, or dirt got into the valve causing it to stick or malfunction. The latter does still occur in very rare instances. However, in ten years, g-valves must have functioned satisfactorily literally millions of times, so the malfunction rate is almost zero.

Malfunction can occur, however, and as with all types of safety equipment, an attempt is made within limitations of weight, available space in aircraft, and cost to provide a safety.

There are actually more such safeties with this equipment than almost any other. First, the valve should only stick open when pulling "g" and at the level of the "g" being pulled. Therefore, at 8G (over the design limits of fighter aircraft) with the valve on high setting, the pilot might get some

9 to 10 pounds pressure in the suit. This pressure is quite uncomfortable to some people, but should not be incapacitating, though it can be distracting. Higher pressures are practically impossible to obtain as the valve won't stick open at a point greater than the "g" being pulled. If it sticks down from manually depressing the cap, it can similarly be jiggled loose. Regardless of this, however, the Adel safety relief valve in jet aircraft valves is designed to bleed off all pressure over 10 pounds and has not been known to malfunction. If the valve did stick down and the safety valve simultaneously malfunctioned completely, a lateral or sideways push on the g-suit disconnect (or a direct pull with the angle disconnect, Air Force type), will break the connection. Throttling back also will reduce the pressure.

It is agreed that ground checkouts of all such equipment is most important and such checkouts and indoctrination should insure that pilots are not strapping the g-suit tube in such a way that pressure to the suit under "g" might be blocked or that disconnect of the suit is made difficult. It is hoped, however, that in urging and conducting such tests, possibilities of malfunction are not exaggerated to an unrealistic degree, so that some pilots might tend to lose confidence in the protective or safety equipment and, as a result, fail to use its tactical and/or life-saving advantages. The flight surgeon particularly must keep speculations, conjectures, and the resultant rumors in proper and realistic perspective. (Cdr R. L. Christy (MC) USN)

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Aviation Safety Officers' Seminar

The U. S. Naval Aviation Safety Activity, Norfolk, Virginia, presented a 3-day seminar for squadron, staff, and station flight safety officers at the U. S. Naval Air Station, Norfolk, Virginia, on 15-17 September. A similar seminar was presented for the West Coast at the U. S. Naval Air Station, San Diego, California, on 11-12 October, and an invitation to attend was extended to all staff and squadron flight surgeons.

As a part of the presentation, Lieutenant Commander A. P. Rush (MC) USN lectured on the "Aero Medical Aspects of Aviation Safety," and Lieutenant John R. Myers lectured on the "Problem Areas in the Field of Survival and Aviators' Equipment."

It is anticipated that these seminars will increase the awareness and interest of flight safety officers in the aviation medical aspects of accident-prevention, injury, and survival. This increased awareness should result in more active participation of the flight surgeon in aviation operational safety problems.

All flight surgeons who are assigned to operational squadrons and who can possibly attend any such seminars in the future are urged to do so.

The mere fact that safety and survival officers are assigned to their squadrons and groups does not relieve the medical officer of his obligation to see that aviation personnel within his cognizance are well trained in, and know first aid, survival, and safety practices. In years past the flight surgeon was wholly responsible for these areas of information and training. Today, there are other officers whose responsibilities extend somewhat into the medical officer's realm and who, on paper, are the parties charged with safety and survival training. However, they frequently need the guidance and help from the flight surgeon particularly in medical and health matters. Thus, the medical officer is still morally responsible to the aviator and aircrewman for most phases of survival and safety training.

Work at being a good Flight Surgeon.

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So You Want To Fly--

Back in the days when men were men and pilots were above we mortals, things were really tough. To prove this point and to further substantiate the old-time naval aviators claims to super mortality, there exist medical histories that throw light on the rigors of aviation physical examinations given in the early 1900's.

As an example of just what Grampa Pettibone went through when being subjected to what was then laughingly referred to as an annual physical examination, the below is excerpted from an actual medical history of a young naval aviator.

A complete and thorough physical examination was completed on 2 Dec 1909, and duly recorded in the officer's medical records. During the following 3 days the officer took the "bicycle" test which resulted in the following notation:

"1. Which test was taken? Bicycle.
2. Did this officer complete the 3 rides within the maximum limit of time? Yes.
1st day -- 32 miles -- 3 1/2 hours.
2nd day-- 48 miles -- 7 hours.
3rd day -- 22 miles -- 2 hours.

Physical Examination - Immediately after test.
Pulse - Rate, 86; Quality, Good; Respiration, Normal.
Is there evidence of exhaustion? No.
What ill effects, if any, have resulted from the test? None."

Again, for his "annual physical" our handlebarred mustached friend was put through the paces. This time after his complete physical check-up on 21 Nov 1910, he was given the "walking" test. Apparently there was some

misgiving concerned with the administration of this test as the following notations indicate:

"Would the proposed test probably endanger the life of the officer? No.
Is the officer incapacitated in any way for the performance of active service? No.
Test taken - Walking.
1st day -- 22 miles -- 7 hours, 35 minutes.
2nd day-- 18 miles -- 6 hours, 30 minutes.
3rd day-- 10 miles -- 2 hours, 55 minutes.
Physical Examination (after test)
Pulse, 92; Respiration, 16; Ill effects, if any, none.

So, when you have difficulty getting your young jet pilot up from his horizontal position on the Schneider bed, or he complains bitterly at having to walk from his seat in front of the television set to the bar for his refreshments, tell him what it was like in the "old Navy".

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