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NOTICE

In compliance with the policy established by the Department of Defense and the Secretary of the Navy regarding publications desired by the various Bureaus and Departments of the Navy, information concerning Aviation Medicine and Preventive Medicine will be included in various issues of the U. S. Navy Medical News Letter. The attention of ALL ADDRESSEES is directed to this important change.

C. J. Brown

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Hints on Clinical Research in Naval Hospitals

The comments given here are intended as a guide, especially to younger officers, and are not directives from the Bureau of Medicine and Surgery. Clinical research is the study of disease in human subjects. Experimental animals may provide supporting data, but in the final analysis evaluation of processes of disease, diagnostic procedures or treatment are evaluated by observations on man. It is well to follow the tenet "first do no harm."

Generally speaking, clinical investigation is directed toward (a) the cause and course of disease and its physiological manifestations in the broad sense, and (b) methods of treatment and management. Whatever the project, the protocol or experimental design is based on the same general principles.

The motivation of the investigator is a most important item. He must have an inherent curiosity and an impelling desire to acquire new knowledge on a wholly objective basis entirely devoid of prejudice. He should have a good background in clinical medicine, an acquaintance with aids that can be provided by the laboratory, and some experience in the approaches to scientific research. Consultative and supervisory aid by one or more experienced investigators, military or civilian, should be available.

The problem is formulated as a project and the project is based on a hypothesis. Supporting the hypothesis is a reasonable familiarity with the literature in the particular field. Exhaustive survey of all the literature may delay the initiation of the program to a point where it becomes "cold". Nevertheless, delving into the literature must be critical and analytical. Before the hypothesis is set up as a project, the investigator determines whether methods exist or can be developed for exact attack on the problem. Then the experimental design is planned, and so constructed that results will be "open to scientific analysis, duplication and verification by others."

It is mandatory that the disease to be studied or treated is identified in the living patient. There is often a factor of error in clinical diagnosis, even in the most favorable circumstances, and every method in both the clinic and the laboratory should be used to place identification on as sound a basis as possible. Of the greatest significance is establishment of controls. No study

is of value unless controls, not merely adequate but ample, are set up. The principle of using "paired cases" should be applied whenever practicable.

Often the investigator wishes to test the effectiveness of drugs. If a disease is considered to run the same course almost invariably, a treatment may be studied in a fairly large group of patients. Controls run at the same time would be advantageous. However, such uniformity of course is exceptional, and it is hard to avoid psychic and other factors of error. Individual case reports may convey information or impressions but are not conclusive; when many are collated, precise study may be instituted.

Two principal methods are available for controlled accurate study of the effects of treatment, namely: (a) the statistical method, and (b) the comparative method or blind test. In the statistical method alternate patients receive or do not receive the treatment. The latter group may be given placebos. This does not often permit true pairing of cases, does not eliminate psychic factors on part of patient and physician, and requires a large number of observations to reduce the error of individual variation.

By the comparative method or blind test one group of patients is treated with the agent under study and a comparable group with placebos. This permits of selection of cases so that the groups are comparable in their manifestations of disease. This may involve also such factors as age, sex, nutrition, environment, et cetera. The test is blind in that agent and placebo are alike in appearance, color, taste, et cetera, and so masked as to be indistinguishable to patient and to physician. This kind of test reduces the error of psychic factors and, by the use of laboratory and clinical criteria, becomes objective. It permits controls in the same period of time, namely "contemporaneous controls." A valuable elaboration is the "double-blind" test. Record cards are filled in by patients on a subjective basis and by examining physicians on an objective basis, without knowledge on either part as to which are treated and which are control patients. The cards are collated by personnel different from those engaged in the actual experiment.

In order that results may be checked by others, the nature of the therapeutic agent must be known and characterized by composition, formula, structure, et cetera. Secret preparations may not be of uniform composition and thus cannot be checked in different hands.

"In a scientific paper, a fully revealed factual content is the only basis for its conclusions." The manuscript should be as concise as is consistent with clarity. First, the problem and its background are to be clearly stated, followed by accurate descriptions of methods and results. A discussion should be comprehensive and cohesive but confined to the subject studies. The conclusions should give a brief outline of the content of the paper and the results. The style of writing should be simple; it is well to avoid picturesque and elaborate phraseology.

Inquiries as to procedure and regulations may be directed via channels to Research Division, Bureau of Medicine and Surgery. (H. T. Karsner, Research Division, BuMed)

Research Studies Electrical Energy Produced in Inner Ear

Recent research reported by the Naval Medical Research Laboratory at the Submarine Base, New London, Conn., concerns the specialized activities of the inner ear by which the energy of incoming sound waves is converted to electrical energy, a phenomenon which falls under the heading of cochlear microphonics. Radio and television have made all of us aware of what the conventional microphone does — convert weak sounds into stronger sounds. The ear by its marvelous self-generated electrical energy is able to act in the same fashion, in ways which research is just beginning to unravel. The electrical energy produced by the ear has actually been recorded and measured in experiments conducted at the Medical Research Laboratory, which is one of the few laboratories working in this field. Testing small animals in electrically-shielded and sound-proofed rooms, Dr. Kempton G. Wing and his associates recorded the rise and fall in cochlear microphonics caused by varying the amount of oxygen supplied the animal, collected blood samples for analysis, and made electrocardiographic tracings.

Their aim in studying how these cochlear microphonics are affected by various degrees of deprivation of oxygen and by changes in the amount of carbon dioxide contained within the blood was to learn certain fundamental facts underlying the production of energy by the receptor cells of the ear. It is hoped that these studies will carry forward and add considerably to studies made by Bornschein and Krejci in 1949.

The Medical Research Laboratory's findings are published in its Report No. 188 entitled "Effects of Changes in Arterial Oxygen and Carbon Dioxide upon Cochlear Microphonics". This report establishes the oxygen requirements for the ear in order to keep its tiny electrical plant working, and shows the extent of oxygen deprivation which will interfere with its normal efficiency, and, again, the amount of oxygen-lack which will produce permanent damage to the hearing mechanism. Similar results are presented for the effects recorded due to varying the normal amount of carbon dioxide.

This information is important to aviators, divers, submarine and caisson workers, physiologists, and other research workers concerned with the effect on hearing and upon the metabolism of the inner ear produced by lack of oxygen or overabundance of carbon dioxide. For instance, a distinct decline in the efficiency of the ear was found to occur when the oxygen in arterial blood fell from 13 cc. of oxygen per 100 cc. of blood to 6 to 8 cc. of oxygen per 100 cc. of blood. This would correspond in rough estimate to the effect of subjecting the animal to an altitude of approximately 16,000 feet. This decline in efficiency was found to be reversible. However, if the process was allowed to continue and the oxygen in the blood fell to less than 2 or 3 cc. per 100 cc. of arterial blood for more than 6 or 8 minutes, permanent damage occurred and complete recovery of the hearing mechanism never took place. (Research Div., BuMed)

* * * * *

Acute Miliary Diseases of the Lung

Disseminated miliary lesions in the lungs, demonstrable on the chest roentgenogram, frequently occur and are seen in a wide variety of diseases. More than 80 conditions capable of producing this appearance have been recorded. Such a long list of possibilities makes it extremely difficult to establish a clinical diagnosis in a given case, and any lead obtainable from the roentgenogram is of considerable help. For instance roentgen evidence of associated enlargement of the hilar and mediastinal nodes, pleural involvement, or cardiac abnormality may suggest one or another etiology. Some writers have considered differences in sharpness, configuration, size, number, and distribution of the individual miliary nodules helpful in differential diagnosis.

An approach which has proved particularly useful, but which has not been emphasized in the literature, is the observation of change in the roentgen findings — specifically, the rate of progression or regression of the miliary appearance. The purpose of this article is to evaluate the importance of observing and recording this rate of change, and to illustrate some of the conditions which can cause rapidly changing diffuse miliary lesions.

It is important that the terminology be clearly understood. In the literature numerous descriptions, many of which are vague, have been applied to the appearance under discussion. Since miliary tuberculosis gives a rather consistent, well-known roentgen picture, an attempt has been made to avoid confusion by describing the present material in terms of this disease. The use of the word miliary, then, denotes a similarity to the roentgen appearance of miliary tuberculosis in regard to size, number, and distribution of the lesions, and is not merely an indication of the millet-seed size of the individual nodules.

A completely uniform roentgen distribution of the nodules in the lungs is not stipulated, since a greater concentration in the central and basal portions is not uncommonly seen in miliary tuberculosis. This does not reflect the even distribution found at autopsy, the discrepancy being probably attributable to the greater thickness of lung traversed by the roentgen beam in these areas. Localized pulmonary emphysema may further modify the distribution as seen on the roentgenogram. The numerous disseminated diseases of the lung which fail to show a distinct miliary character are not included in this study.

Classification of miliary diseases into acute, subacute, and chronic categories offers certain advantages in differential diagnosis. A grouping based on serial roentgenograms and not on the clinical course which usually, but not invariably, coincides with it is used. This classification implies a striking change, progressive or regressive, in the visibility or distinctness, size, and number of the miliary nodules. With these points in mind the following time factors have been arbitrarily set: 1. Acute: Change demonstrated in less than 2 weeks. 2. Subacute: Change apparent in from 2 to 8 weeks. 3. Chronic: Failure to change within 8 weeks.

It is a common experience at autopsy to find miliary lesions which have failed to register on a chest roentgenogram made a few days earlier. Roentgen visibility of the miliary densities is affected by a number of factors. Of

these the size of the nodules is probably the most important. The critical level of visibility is said to be 2 or 3 mm. diameter. A difference of opinion exists as to whether each lesion, as seen on the roentgenogram, is a summation image due to superimposition of several nodules, or a real image of a single nodule. In either event, the number and sharpness in outline of the nodules certainly play a role in their perception. Also of importance in their demonstration is a roentgenogram of good quality (small focal spot, suspended respiration, proper exposure, and processing factors). Finally, the presence of other diffuse pulmonary abnormalities, such as emphysema or pulmonary edema, may affect the visibility of the miliary lesions.

The index files of the Department of Radiology of the Cincinnati General Hospital for the past 5 years were examined, and the roentgenograms of all cases showing miliary lesions in the lungs were studied for evidence of acute change as defined above. Selected cases from the files of Children's Hospital were added. The acute cases together with a review of the literature, form the basis of the present report.

The roentgen manifestation of diffuse miliary lesions in the lungs occurs in a wide variety of conditions. A specific diagnosis is often difficult or impossible to establish by clinical, laboratory, and roentgenologic means.

A classification into acute, subacute, and chronic groups, based on the rate of progression or regression as seen on the roentgenogram, has been useful in the differential diagnosis of such cases.

Forty conditions which may cause an acute miliary appearance on x-rays are recorded. Of these, 24 are exceedingly rare. Clinical, laboratory, and roentgenologic aids in the differential diagnosis of the remaining 16 diseases are discussed.

Illustrative cases are reported, including examples of miliary tuberculosis, Shigella pneumonia, chickenpox pneumonia, measles pneumonia, blastomycosis, histoplasmosis, acute diffuse pneumonia in chronic lung disease, bronchiolitis fibrosa obliterans, diffuse miliary granulomatous pneumonitis of unknown etiology, primary atypical pneumonia, and infectious mononucleosis. (Radiology, July 1952, B. Felson)

* * * * *

Torular Meningo-Encephalitis

Torula invasion of the central nervous system is a relatively uncommon occurrence if its incidence is to be based on fully verified recorded cases. Only 2 such instances have been encountered at St. Joseph Infirmary; and a survey of the literature discloses that only about 230 cases of human torula infection have been reported since this entity was first described. Torula almost invariably invades the central nervous system, but the total number of cases of torulosis is somewhat higher than meningo-encephalitis. Of a total of 220 reported cases recently reviewed, 81% exhibited central nervous

system involvement. Only 12 instances in which either the spinal cord or its membranes showed involvement of torula have been reported.

Although acute forms of the disease have been known, typical torula infections are chronic and usually involve the central nervous system and lungs. Isolated instances of recovery have been cited, but death is the expected termination of the disease. Very few diagnoses have been made before death.

The purposes of this report are to record 2 additional cases, 1 being recognized before death, and the other still living; to call attention to the various methods which can be used in the diagnosis; and finally to express the view that human torulosis may not be as rare as formerly believed.

The clinical picture of torula infection of the central nervous system is of meningo-encephalitis of slow onset. Intermittent headache of increasing frequency and intensity is the most frequent initial symptom. This may be followed by stiffness of the neck, symptoms of a focal brain lesion, irritability, and ultimately, profound mental disorders. Nuchal rigidity, positive Kernig's sign, ophthalmoplegia, and papilledema are the manifestations most constantly observed. The course is progressively downhill, with a fever seldom above 101 F., to death in coma with respiratory failure, as in the second case reported here.

Not infrequently, because of the pathologic alterations in this disease, which cause an interruption in the flow and reabsorption of the cerebrospinal fluid and provoking signs of increased intracranial tension, the presence of any expanding cerebral lesion is strongly suspected. Because of that, intracranial exploration is often carried out. No neoplasm is found and only rarely are torular granulomas, single or multiple, encountered.

In an analysis of 178 cases of torulosis with central nervous system involvement, Carton and Mount found 42 cases in which an expanding intracranial or intraspinal lesion was suspected and an operation performed. In the 42 cases only 9 tumors, or granulomata, were found at operation and 2 at autopsy. A correct diagnosis can be reached only on the recovery and full recognition of the causative agent.

The clinical diagnosis of torula meningo-encephalitis is difficult, if not impossible, without the identification of the causative organism. It is a challenge that must be met in every instance of a chronic meningitic process in which tuberculosis and syphilis are excluded; in instances of increased intracranial pressure, with or without localizing signs, associated with pleocytosis and xanthochromia in the cerebrospinal fluid; and in any obscure disease of the central nervous system in which a pleocytosis of the cerebrospinal fluid is found. In such situations the identification of the causative organism is imperative.

Patients with torulosis of the central nervous system have been treated with a variety of therapeutic agents. In no instance was there a permanent cure. Even those who had an extended survival period were not well; in the majority of patients death occurred within 6 months of the onset of symptoms.

No consistent results, either in vivo or in vitro, have been obtained with sulfonamides, iodides, arsenicals, quinine, streptomycin, autogenous vaccine, intravenous alcohol, actidione, or acriflavin. Some investigators, however, have found torula to be susceptible to penicillin in vitro. Most investigators, however, have found penicillin to be ineffective, both in vivo and in vitro. Stone and Sturdivant found x-rays effective in inhibiting the growth of torula in culture, but the effect of radiation in their patient and in Warvi and Rawson's patient was questionable. The investigative work of Kuhn would suggest that hyperthermia might be used as a method of treatment in view of the fact that torula infection rarely produces high fever. His theory, however, loses some of its appeal in view of the observations of Cox and Tolhurst that the few patients reported with high fevers died more rapidly than the average case. Hyperthermia has not yet been used in human torulosis, and in view of the uniformly hopeless prognosis, it seems worth trying, despite this theoretical objection. Streptothricin has been found to inhibit the growth of torula in concentrations which can be obtained in body fluids, including the cerebrospinal fluid. Its absorption, excretion, and distribution are roughly similar to that of streptomycin. The toxicity of streptothricin has not been fully studied, but what evidence is available points against its clinical usefulness, particularly in the central nervous system. It has not yet been used against disease, as far as is known, either in animals or in humans. Since the cryptococcus is known to produce acid, alkalization therapy has been used recently, but the results have been inconsistent. (Journal of the Kentucky State Medical Association, July 1952, T. M. Marshall)

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Butazolidin in Rheumatoid Disorders

Butazolidin is a new compound which may have exceptional promise in the treatment of rheumatoid arthritis and allied disorders. Chemically it is 3,5-dioxo-1,2-diphenyl-4-n-butyl-pyrazolidin, a compound entirely unrelated to the steroid hormones. It is also known by the generic designation, phenylbutazone. In pure state, Butazolidin is a white or slightly yellow crystalline powder of somewhat bitter taste. It is insoluble in water but may be dissolved in alkalis, in ethyl alcohol, and other organic solvents.

The average effective dosage of Butazolidin is 600 to 800 mg. daily taken in divided amounts. In most instances, this dosage will provide satisfactory therapeutic effect. However, in the absence of symptoms of intolerance, the dose may be cautiously increased if therapeutic benefit is not achieved. Once improvement has been obtained on this higher dosage, a gradual downward adjustment should be made to the minimal level required for maintenance. Some patients are well maintained on a dosage as low as 100 mg. a day.

To minimize gastric irritation, Butazolidin should always be taken immediately before or after food or with a full glass of milk. The administration of an antacid sometimes proves helpful in overcoming "dyspeptic" symptoms induced by the drug.

The action of Butazolidin is usually manifested by the third or fourth day of treatment. It is seldom necessary, therefore, to continue trial therapy with Butazolidin beyond a week in the absence of a favorable result.

In the treatment of relatively transient conditions such as tendinitis, capsulitis, and bursitis, Butazolidin may be discontinued a few days after symptoms have been completely relieved. In the event of relapse, subsequent attacks are usually as responsive to treatment as the first, and therapy may be conducted on similar lines.

In the treatment of the more chronic disorders, Butazolidin may be continued indefinitely in the minimal dosage required to keep the patient comfortable and free from acute exacerbations. Such maintenance dosage is generally 600 mg. daily, but this may be reduced to 200, or even 100 mg. a day.

Sixteen cases of rheumatoid arthritis and 12 cases of bursitis, capsulitis, and tendinitis, were treated experimentally with Butazolidin as the sole form of therapy. The drug was found to be subjectively and objectively effective in all cases of rheumatoid arthritis although clinical improvement was not reflected in fall of sedimentation rate. The drug was discontinued in 2 patients because of nausea, vomiting, and exaggeration of pain in joints affected with the hypertrophic type of arthritis.

Clinically there was a minimum response of 75% relief of pain and swelling. There was increased mobility of the joints proportionate to the decrease in pain. Two patients who were no longer able to continue the use of cortisone because of the development of Cushing's syndrome and hypertension were placed on Butazolidin therapy. Both continued to be free of pain and there was a definite remission in Cushing's syndrome. This remission was probably no more rapid than would follow simple discontinuation of cortisone. It is not to be presumed that the Butazolidin hastened the regression of Cushing's syndrome.

Both acute and chronic capsulitis and bursitis of the shoulder respond rapidly to Butazolidin therapy. The response was possibly more marked in the acute cases. There was only 1 patient with capsulitis of the shoulder who did not respond, and it is believed that the dosage in that case was too low. Two patients with epicondylitis of the elbow responded promptly to the medication. This use of the drug should be investigated further because rheumatoid arthritis is usually resistant to presently available forms of therapy. (J. M. Soc. New Jersey, July 1952, C. H. Smith and H. G. Kunz)

* * * * *

The Relation of Obesity to Menstrual Disturbances

There is a widespread clinical impression that obesity is related to amenorrhea and perhaps other functional disorders of menstruation. Wharton's standard textbook of gynecology lists obesity as commonly associated with amenorrhea. Duncan mentions that various disturbances of menstruation, including dysmenorrhea, functional bleeding, amenorrhea, and infertility, are frequently associated with obesity and that weight reduction can be effective in alleviating the menstrual disturbance. Other authors indicate the not infrequent relation of obesity and menstrual disturbances, and Given mentions weight reduction as a therapeutic measure in obese women with amenorrhea.

A careful search of the literature of the past 22 years discloses no systematic study of a large group of patients with menstrual abnormalities to determine the validity of this clinical impression. Armstrong and others have commented on the need for studies on the relation of obesity to endocrine function. This article presents statistical evidence indicating a significantly increased incidence of obesity in patients with amenorrhea compared with a similar group of women without menstrual disturbances and considers the possible relation of obesity to other types of functional disorders of reproduction.

The incidence of obesity in a group of 100 young women with functional menstrual disorders, infertility, and habitual abortion was investigated. Forty-three percent were found to be 20% or more over their calculated ideal weight. Amenorrhea was the most frequent menstrual disorder, and 48% of the patients with amenorrhea were obese in contrast to a 13% incidence in a control group. The results, which are statistically significant, give factual proof to the clinical impression of the association of obesity and menstrual disturbances. The possibility of a hypothalamic origin of both obesity and amenorrhea is briefly discussed. (New England J. Med., July 10, 1952, J. Rogers and G. W. Mitchell, Jr.)

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The Oral Surgeon's Role in Management of Unerupted Teeth

The orthodontist and the oral surgeon are concerned with the management of impacted and unerupted teeth. Conservative surgery is often a valuable adjunct to orthodontic procedures. Teeth have been sacrificed because neither the general practitioner nor the surgeon are aware of possibilities that exist when certain unerupted or impacted teeth are exposed. These teeth often can be conserved to become a useful dental unit. The purpose of this article is to point out certain aspects in the surgical technique for uncovering teeth which have been found useful to the orthodontist regardless of the type of procedure used.

Successful treatment of the unerupted or impacted tooth depends upon the proper evaluation of the roentgenographic examination. Important factors con-

cerning treatment of the tooth are: 1. The surrounding anatomical structures. 2. The presence of pathologic conditions related to the tooth. 3. The condition and position of the tooth or teeth.

Frequent x-ray examinations for reviewing the position of unerupted teeth cannot be overemphasized. A normal position of the tooth at one age group may be abnormal for an older age group. The proper time for removal of deciduous teeth may be better determined by thorough x-ray examinations, than by age groups.

The following teeth are discussed separately according to the technical aspects of surgical exposure: The third molar, premolar, incisor, and canine. These teeth are treated as individual problems and create variations in technique because of the position in the jaws and varying eruption times.

A method of diagnosis and treatment of unerupted teeth is presented. Following the clinical examination and roentgenographic findings, the teeth are adequately exposed for orthodontic guidance. A surgical path of eruption is advocated to facilitate early orthodontic treatment. A technique for the placement of a pin for palatally impacted canines is discussed. Important factors regarding this technique include the depth and direction of slot in the tooth, the use of a heavy platinized gold pin, and a sterile, dry surface.

Conservative surgical management of unerupted teeth for future components of the dental arch is sufficiently successful to warrant its employment in all cases where there is no existing pathologic condition. (Am. J. Orthodontics, July 1952, C. S. LaDow)

* * * * *

Rapid Polymerization and Cementation in Denture Construction

Few materials for dental use have attracted as much interest in the dental profession as the introduction of cold, rapidly solidifying plastic products. Manufacturers and distributors have advertised the outstanding properties of these improved resinous compounds, drawing attention to their wide application and the simplicity of manipulation. This publicity, followed by restorative experimental service, has been far reaching, and there appears to be a decided difference in opinion as to whether the advertised claims can be substantiated. This article is designed to present an entirely different concept of what takes place during the period of polymerization and to furnish some data on research and clinical observation as applied to the prosthetic field, but it should be understood that the chemical and physical properties of these rapid polymerizing resins have a basic relationship, regardless of where they are used.

The practical application of this type of material to the construction of a denture base is relatively new, and yet there is very little difference in chemical and physical composition between the new "cold" resin compound and standard "hot" acrylic materials. In the comment and analysis following

the terms, "hot" and "cold" are used for simplicity. It is fairly well understood by dentists that rapid or cold polymerizing preparations contain an activating catalyst which causes a quick heat reaction when the monomer and polymer are mixed together, resulting in solidification of the material. As a rule, only a small amount of the catalyst in combination with some accelerating agent such as an amine, metallic, nonmetallic acid, or alkaline is used. The size and shape of the polymer contributes much to the speed and hardening of the material.

Cold denture base products as compounded and manufactured today still lack some of the physical properties of the regular hot denture base materials. This is especially true if the American Dental Association Specification No. 12 for Certification is required. It is hoped that the Association will, in the near future, set up a new classification and requirements for the cold polymerizing denture base material. Cold products possess certain outstanding qualifications as denture base material. The following may be listed as their advantages: (1) Elimination of applied heat. (2) Internally generated heat control. (3) The flask and investment are never warm. (4) Superiority in cast adaptation. (5) Greater pressure without danger of breakage. (6) Processing time is 20 minutes. (7) Denture may be removed from the flask immediately. (8) Less internal strain. (9) Material is dense without voids. (10) Denture may be finished and polished at once. (11) It is time saving and simple to process. (12) Little equipment is necessary. (13) Generated heat is self-limiting. (14) Absence of mouth irritation. (15) Molding details are unsurpassed. (16) Distortion from temperature changes are reduced to a minimum. (Journal of Prosthetic Dentistry, July 1952, E. B. Kelly)

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Clinical Experience with "Polycin," a Polymyxin-Bacitracin Ointment

Recent years have witnessed the advent of a number of new agents for local therapy in pyogenic infections of the skin. Certain of these, however, are not without disadvantages. Topical use of the sulfonamides and penicillin, while very effective, has resulted in sensitization in at least 5 and 10% of the cases, respectively, with indications that reactions to penicillin are increasing both in frequency and in severity. The use of nitrofurazone (furacin) has likewise resulted in a significant degree of sensitization, reactions occurring in about 5% of the cases. Good results have been reported for dihydrostreptomycin in topical therapy, with sensitization manifested in 3.7% of patients treated. Prolonged use of this drug was not recommended because of the rapid development of drug-fastness. The incidences of reactions obtained with the sulfonamides, penicillin, and dihydrostreptomycin thus become important because these drugs are intended mainly for systemic use.

Perhaps the least allergenic of local agents currently used is bacitracin, with a reported sensitization rate of less than 0.5%. Although extremely effective in local treatment of pyogenic infections, bacitracin has been found to exert its in vitro antibacterial action chiefly against gram-positive bacteria. With the exception of the gonococcus and meningococcus gram-negative organisms are resistant. Fungi are also resistant to the antibiotic, while spirochetes have shown marked susceptibility.

Considerable attention has recently been given to the polymyxins, a group of closely related antibiotics effective mainly against gram-negative bacteria and certain pathogenic fungi. Isolated from various strains of Bacillus polymyxa, the polymyxins, 5 of which have been identified and designated as varieties A, B, C, D, and E, are basic polypeptides differing from one another in amino acid composition. A salient feature of these antibiotics is that bacterial resistance is produced only with great difficulty. In effective concentrations the polymyxins are bactericidal in action and do not appear to be appreciably antagonized by blood or serum. They are stable at room temperature in the dry state, and solutions have been kept refrigerated for 2 weeks without loss of potency. The successful use of polymyxin B has been reported in influenzal meningitis, shigellosis, and urinary tract infections caused by Escherichia coli, Aerobacter aerogenes, and Pseudomonas aeruginosa. Of special interest is that the polymyxins have been found to be the most effective antibiotic against Ps. aeruginosa, the etiologic significance of which is becoming more recognized in a number of diseases, particularly otitis externa and media, and suppurating wounds and burns. A study of the topical use of polymyxin B has been reported in which granulating wounds infected with Ps. aeruginosa were sterilized after application of the antibiotic in saline solution or in a polyethylene glycol (carbowax) base. A significant finding was that none of the usual reactions indicative of sensitization developed in any of the patients.

In a search for a relatively nonallergenic preparation for topical use and one which would be active against a wide variety of micro-organisms, the above facts suggested the clinical use of a combination of polymyxin B sulfate and bacitracin.

Because of differences in diffusability and stability of polymyxin and bacitracin, a number of ointment bases were studied before one was found which afforded maximum release of the antibiotics and in which both types of agents remained stable over a sufficient length of time. The base found most suitable consisted of (1) liquid petrolatum, (2) white petrolatum, (3) a polyhydric alcohol fatty acid ester ("glyco wax S932"), (4) polyethylene glycol 400 di-stearate, and (5) polyethylene glycol 400 di-laurate. Polymyxin B sulfate was incorporated at a concentration of 8,000 units per gram of base, and bacitracin, at that of 400 units per gram.

Results of the present study indicate that the superiority of bacitracin in local treatment may be greatly enhanced when the antibiotic is used in combination with polymyxin B. The base in which the antibiotics were incorporated

has been found well suited for the stability of the antibiotics and for their release from the base. As determined quantitatively by the seeded-agar assay method, diffusion was much more rapid from the new base than from the conventional grease-type bases. In addition to its marked efficacy in treatment of infections of mixed bacterial origin, "polycin" appeared to possess an index of sensitization no greater than that demonstrated for bacitracin alone, and because sensitivity to bacitracin is very rare, there would be little danger from frequent and prolonged use.

It is noteworthy that while "polycin" proved effective in clearing the bacterial elements in patients with various secondarily infected dermatoses, in no instance did it excite or aggravate the underlying skin conditions, which included such diseases as dermatophytosis, contact dermatitis, eczema, psoriasis, and neurodermatitis. In several cases of dermatophytoses, there was some indication that the fungal infection had been benefited also, which may signify that the continued activity of such lesions is often caused by bacterial infection. Further study of the relative merits of "polycin" in secondarily infected dermatophytoses seems warranted.

One hundred forty-seven patients with superficial infections of the skin were treated with the ointment containing a mixture of polymyxin B sulfate and bacitracin. Only 3 patients failed to respond to treatment. Bacteriologic studies showed that "polycin" was especially effective in controlling lesions harboring both gram-positive and gram-negative organisms. The low rate of sensitization so far observed makes the ointment an ideal preparation for topical use. Although 75 patients were treated for bacterial infections superimposed on other skin diseases, in no instance did "polycin" excite or aggravate the primary condition. (A. M. A. Arch. Dermat. & Syph., July 1952, F. M. Gastineau and H. J. Florestano)

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Allergy of the Inner Ear

The physiologic basis of allergy of the inner ear, usually termed Ménière's disease, is considered in its several variations. These are autonomic dysfunction with its stereotyped or invariable reaction on the peripheral vascular bed, resulting in transudation of an excess fluid high in protein content and consequent elevated osmotic pressure. The vestibular symptoms seem to be mainly due to vasospasm, while the cochlear symptoms appear to depend in the main on an increase in endolymph of high osmotic pressure.

The importance of, and some of the pitfalls in, differential diagnosis are stressed, and some illustrative case reports are reviewed. The treatment which has given the most satisfactory results at the Mayo Clinic has been a modification of Schemm's diet with other measures to help in the elimination

of sodium, administration of a vasodilator to decrease arteriolar spasm, and administration of an inhibitor to depress overactive cholinergic nerves.

If a definite diagnosis of Ménière's disease can be made, not only relief from the vertiginous crises but also restoration of hearing can usually be secured if the patient can and will adhere to the regimen described. Many of these patients are subject to anxiety and tension states. Relief of these conditions is of great importance in a favorable clinical result.

Since Ménière's disease appears to be an expression of an inherited constitutional tendency, it would be expecting too much of any therapeutic plan to eradicate such a tendency. Therefore, even after symptoms have been relieved recurrences are to be expected. Few patients are so situated that they can devote their entire time to control of this disorder. Treatment, therefore, should be designed with the well being and maximal convenience of the patient uppermost in mind.

Successful medical treatment of Ménière's disease has been based on the hypothesis that the condition is due to a localized dysfunction of the normal autonomic defense mechanism which includes the peripheral vascular bed, in other words, an allergy. So-called specific therapy, such as elimination of foods and contacts or specific desensitization, however, has successfully relieved the disorder in a few cases. Such immunologic reactions may be a continually recurring precipitating factor, and the possibility of their presence should not be ignored. In the author's experience, however, the more frequent precipitating factor is a physical stimulus.

Therefore, use of a logical combination of therapeutic agents known to affect the various factors operating in physical allergy seems reasonable, rather than use of one and then another agent in tandem. The first measurable evidence of the restoration of hearing may not appear until after 2 to 4 weeks of vigorous treatment. Therapeutic trial, therefore, should not be given up too early. (A. M. A. Arch. Otolaryng., July 1952, H. L. Williams)

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Carbon Tetrachloride Poisoning

Carbon tetrachloride poisoning is a subject of increasing importance. Many nonindustrial cases of carbon tetrachloride poisoning are undiagnosed, the condition being usually treated as nephritis, heart disease, or hepatitis.

Many persons believe carbon tetrachloride to be a relatively safe cleaning agent. Its nonflammability is one reason for its widespread use. The average nonmedical user does not know that the toxicity of carbon tetrachloride is enhanced in alcoholics or in malnourished persons. The exact mechanism of the increase in alcoholics is not clear. The increased toxicity may be due to increased absorption of the carbon tetrachloride, or it may be due to previous damage done to the liver and the kidneys by alcohol, or both. Almost all of the author's cases of poisoning involved persons suffering from

chronic alcoholism or men who had been drinking before or during exposure. In some cases fellow workman who had not been drinking alcohol were exposed to the same concentration of carbon tetrachloride fumes and were unaffected.

Carbon tetrachloride is a clear, colorless, aromatic liquid. The vapor density, compared with air, is 5.32. The boiling point is 76.7 C. It is nonflammable, nonexplosive, and will not support combustion. In the presence of excess water or high temperatures such as occur in open flames, it decomposes into hydrochloric acid and other products. It is soluble in about 2,000 times its volume of water. It is miscible with alcohol, chloroform, benzene, and ether.

It is used as a degreaser for metal parts, a dry-cleaning agent, and a solvent for crude rubber, tars, and resin. It is also used in fire extinguishers, insecticide sprays, soap solutions, as a delousing agent, as a dry-hair shampoo, as an anthelmintic, in the extraction of oils from pressed cakes and seeds, in the fumigation of grain, and in the manufacture of dichlorodifluoromethane (freon 12). As a fire extinguisher and as a dry-cleaning agent it is sold under many trade names.

Carbon tetrachloride is potentially toxic by inhalation, by contact with the skin or mucous membranes, or by oral intake. Toxicity may result from a single brief exposure to a high concentration of vapor or prolonged, excessive, or repeated exposure. The previous safe limit for the vapor was set at 100 ppm, but probably should not be more than 50 ppm.

When carbon tetrachloride is being used, ventilation should be provided at floor level as well as at the usual higher elevations. Pits, depressions, and basements should be avoided, since the vapor is heavier than air. Small quantities should be transported in safety cans. Uncovered pails and other containers should be prohibited. Rags or mops wet with the compound should be placed in closed containers until they can be dried safely outdoors or in a ventilator.

The immediate symptoms of carbon tetrachloride poisoning are: (a) Those due to inhalation: dizziness, giddiness, a vague sense of fullness in the head, headache, and, occasionally, nausea. If there is a heavy concentration of fumes, there may be mental confusion and even unconsciousness. (b) Those due to ingestion: usually immediate nausea and vomiting, followed soon by diarrhea.

Later symptoms and signs due to either inhalation or ingestion of carbon tetrachloride are nausea, vomiting, loss of appetite, diarrhea, headache, fatigue, and abdominal pain. Jaundice may appear. Hematemesis may occur. There may be early kidney damage with progressive oliguria as early as 24 hours after exposure.

In every case of jaundice, nephritis, or congestive heart failure in which the patient has no previous history of such disease, and in which no apparent cause is found, the patient should be specifically asked about the use of solvents and cleaning solutions.

The following persons should not use or be exposed to carbon tetrachloride: alcoholics, obese persons, undernourished persons, those with pulmonary diseases, peptic ulcer, hypertension, hepatic, renal, or cardiac disease, and persons with a hypersensitivity related to carbon tetrachloride or to other chlorinated hydrocarbons.

In the past most deaths of persons with carbon tetrachloride poisoning have been caused by pulmonary edema occurring during lower nephron nephrosis. A small percentage of the victims have died from liver disease, usually acute or subacute yellow atrophy, and some have died from toxic potassium levels.

The deaths from pulmonary edema can be prevented in most cases by simple measures of treatment. Lavage procedures or the artificial kidney are necessary only in cases with potassium intoxication or in those not responding to the simpler methods of treatment. (A. M. A. Arch. Indust. Hyg. and Occupational Med., July 1952, A. V. Myatt and J. A. Salmons)

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Surgery of Autonomic Nervous System

Excision of the cervical sympathetic chain is being employed in cases of cerebral vascular disease. The effectiveness of this procedure, however, is yet to be proved.

When sympathetic denervation of the upper extremity is indicated because of diminished circulation due to arterial wounds, embolus, or thrombosis, or in cases of causalgia, Raynaud's disease, and hyperhidrosis, the procedure most commonly employed is a modification of Smithwick's upper thoracic preganglionic sympathectomy. If sympathectomy is to be performed for the relief of angina pectoris, a most extensive procedure is indicated, such as the excision of the stellate and the four upper thoracic sympathetic ganglia.

For the relief of painful conditions within the abdomen, the supradiaphragmatic sympathectomy, sometimes called splanchnicectomy, is preferred. The effectiveness of this procedure in the pain of pancreatitis is described by deTakats. In this case the aim of the surgeon is to interrupt the visceral afferent fibers which traverse the sympathetic system. The interruption of the sympathetic fibers is incidental to the accomplishment of this object.

In hypertension the four most commonly employed operations are the supradiaphragmatic sympathectomy, the subdiaphragmatic sympathectomy, the thoracolumbar sympathectomy, and the so-called complete sympathectomy. Considering the morbidity involved in the more extensive procedures, it is the author's opinion that the supradiaphragmatic sympathectomy of Peet is probably preferable. However, the effectiveness of some of the newer sympathetic blocking agents will probably relegate the surgery of hypertension into discard.

At the present time the most commonly employed operative procedure on the sympathetic nervous system is lumbar sympathectomy. It is indicated in

cases of deficient circulation in the lower extremity caused by arterial wounds, embolus, thrombosis, Buerger's disease, arteriosclerosis, and in cases of traumatic causalgia. Occasionally Raynaud's disease may affect the lower extremities to the extent that lumbar sympathectomy is indicated. The benefit following lumbar sympathectomy is due not only to the interruption of the efferent stream of sympathetic impulses but also, in part, to the interruption of the afferent painful pulses which traverse the lumbar sympathetic chain and accelerate the rate of discharge of vasoconstrictor impulses.

There are various theories as to why causalgia is frequently relieved by sympathectomy. One explanation is that offered by Doupe, Cullen and Chance who believe that afferent discharges over the sympathetic pathways traverse the "artificial synapse" at the site of the nerve injury, and in this way produce impulses in afferent nerves resulting in a sensation of pain. It is, therefore, easy to see how a continuous flow of efferent sympathetic impulses going down a mixed nerve could become short circuited at the point of injury and jump across to the naked axis cylinders of the afferent nerves with the production of a pain impulse.

Operations for conditions produced by overactivity of the parasympathetic nervous system are vagus nerve resection for peptic ulcer, the resection of the carotid sinus nerve or, more effectively, by resection of the glossopharyngeal nerve intracranially, as advocated for the relief of carotid sinus syncope. (Cleveland Clin. Quart., July 1952, W. J. Gardner)

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Spina Bifida

Congenital anomalies, are now justifying increased attention. Every physician during his practice may encounter several patients whose conditions may be ameliorated or cured by judicious care or surgical intervention. Spina bifida, with its related neurologic anomalies, has been a source of perplexity for many years to the general practitioner, pediatrician, neurologist, and surgeon. Even when a case appears to be hopeless a competent understanding of these lesions and their clinical manifestations permits the physician to answer intelligently the questions posed by anxious parents and to instruct them in treatment and prognosis. A survey of 225 encephaloceles, meningoceles, and myelomeningocele studied in the University Hospitals during the period from 1938 to 1950 is presented.

The incidence of meningoceles, myelomeningocele, and encephaloceles is about 1 in 1,000 births. Females outnumber males in a ratio of 1.6 to 1. In three-fourths of the 199 patients with spinal dysraphism the lesion was classified as a myelomeningocele. Ninety-nine (44%) of the 225 patients were subjected to operation. The operative mortality was 8.0%. At the present time 20% of the patients with meningocele or myelomeningocele and 30% of

those with encephaloceles are classified by the parents as "well" and unhampered by any significant incapacity from their anomaly.

One hundred cases presented 217 associated congenital anomalies (excluding club foot, dislocated hip, and hydrocephalus). The incidence of these cranial and spinal malformations among families in which the deformity has already occurred once was 56 times (1 in 18) the incidence in the population at large (1 in 1,000).

The incidence of any deformity among families in which meningocele, myelomeningocele, or encephalocele has occurred was 37 times (1 in 6) the incidence of any deformity in the general population (1 in 213)

The preponderance of cranial and spinal dysraphism in females and the incidence of abnormalities in the relatives constitute presumptive evidence in favor of a familial factor in the cause of these lesions. (A. M. A. Am. J. Dis. Child., July 1952, J. T. Schwidde)

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Acute Progressive Unrelenting Renal Failure

There are increasing indications that the acute renal insufficiency primarily caused by tubular damage can be divided into several clinical types. The most common clinical type is recoverable, particularly when a conservative regime of management is stringently followed. This type, as a rule, has three clinical phases, namely, the phase of shock, which appears to be its most common antecedent and/or aggravating cause; the phase of maximal renal failure, which may last for from 8 to 14 or more days; and the phase of recovery, which is begun by diuresis lasting for from 7 to 10 days and is followed by a period of renal convalescence. This period is usually of minor consequence to the patient and lasts 1 to 6 months during which renal function returns to its former status.

Three variants within this common recoverable type are apparent at present. First, the degree of recoverable renal failure may vary markedly. Thus, it is possible to classify such cases into mild, moderate, and severe forms. Arbitrary clinical criteria may be utilized for this separation. A mild case enters into the phase of diuresis within 5 days and, accordingly, has a mild azotemia, minimal or no acidosis and hypochloremia, and frequently a rapid return of the concentrating power of the kidneys. A moderately severe case enters into the diuresis within 5 to 10 days and displays a fairly pronounced level of azotemia, definite but variable acidosis and hypochloremia, and a prolonged interval of isosthenuria. The severe case remains oliguric (urine volume less than 1,000 cc. with low specific gravity) for 10 days or longer, displays a prominent acidosis, hypochloremia, and a prolonged renal convalescence. Hyperkaliemia is, at times, an added complication of this variant. The severe case, when recoverable, although not displaying diuresis within 10 days, ordinarily shows signs of renal recovery by this time, mainly in the form of a progressively increasing urine flow. Diuresis usually begins within 12 to 14 days.

Second, another variant of the recoverable type has been recently discussed. In this form, the patient has a moderate or severe form of renal failure which during and following the phase of diuresis displays considerable renal salt (NaCl) wastage. The period of salt wastage has extended for as long as 40 to 60 days, during which time as much as 300 to 800 mEq. (18 to 48 gm.) of sodium chloride daily may be required in order to maintain balance. Following this interval the kidneys recover their ability to conserve salt. One must be vigilant for this potential complication for severe grades of the syndrome of salt deficit may ensue. Moreover, the recoverable nature of this complication has indicated the need for the prolonged high salt intake.

Third, during the progress of what appears to be a moderate or severe form of recoverable renal insufficiency outstanding extrarenal and extrauremic complications may develop which, of themselves or in combination with uremia, may prove fatal. It does not appear just to consider such deaths as entirely uremic. Complications include: massive pulmonary embolism, an existing pulmonary carcinomatosis with dyspnea and cyanosis, an existing diffuse pneumonitis with cyanosis, anasarca with pulmonary edema and bronchopneumonia, and the so-called water intoxication syndrome.

The authors discuss still another type of acute renal insufficiency due to tubular damage (acute tubular nephropathy). This condition appears to be distinct and apart from the above variants both by its clinical manifestations and by the morphologic changes observed in the kidneys on post-mortem examination. In the present report the collective characteristics of 10 such cases together with the post-mortem examination of 8 cases are presented. In addition the prognostic and therapeutic outlook for this type of renal insufficiency is discussed.

This latter type has been characterized clinically by an acute, progressive, unrelenting renal failure which yielded to none of the therapeutic approaches attempted. It has been closely related to a prolonged period of profound shock. Morphologically, its outstanding feature has been the demonstration of advanced damage to the proximal and distal segments of the renal tubules (universal tubular damage or upper and lower nephron nephrosis).

Prolonged and profound peripheral circulatory failure (shock), possibly modified by blood transfusions and crystalloid infusions, is associated with the development of a nephropathy characterized by serious damage to the upper and lower renal tubular segments and an acute progressive unrelenting renal failure. The renal failure is associated with hypertension, mental aberrations, respiratory distress, diarrhea, and persistent anemia. All approaches toward the management of the uremia thus far, including the use of peritoneal irrigation, have failed. Evidence of widespread tissue damage has been noted in post-mortem examinations.

Of fundamental importance is the question of whether shock per se or uremia is the primary cause of death. In view of the latter possibility it is considered that this type of case represents a great challenge for the procedures designed to remove waste products from the body and alleviate the uremic state. (Surgery, July 1952, E. E. Muirhead and J. A. Stirman)

The Role of Energy, Pupillary Diameter, and Alloxan
Diabetes in the Production of Ocular Damage
by Microwave Irradiations

The formation of cataract as a result of irradiations of infrared, ultra-violet, and roentgen rays long has been established. Interest in irradiation cataract has been renewed by the observations that lenticular opacities may be induced by 12-cm. irradiations and 3.0-cm. irradiations. Since these phenomena have been only recently demonstrated, little work has been carried out to evaluate the conditions contributing to the damages observed.

One of the purposes of this investigation was to select the 12-cm. wave-length portion of the spectrum and evaluate more carefully the magnitude of energy necessary for opacity formation and to study the contributory variables, both physical and chemical.

It was believed that such evidence might clarify the problem of whether the pathologic processes observed were caused by induced temperature per se or by this factor in addition to changes in the metabolic system of the eye as a result of irradiation by microwaves.

Included among the problems investigated in these studies were: (1) The minimum irradiation necessary for opacity formation. (2) The magnitude of delay following irradiation before the formation of observable opacities. (3) The effect of pupillary diameter upon the incidence of cataract. (4) The type of lenticular opacification formed by 12-cm. microwave exposure. (5) The effect of alloxan-induced diabetes upon the amount of microwave energy required to induce cataract formation.

1. Exposure of the eyes of rabbits to 12.25-cm. microwaves of 100 watts output at a 6-inch distance for 20 minutes resulted in no observable opacities over an 8-month period. (2) Similar exposures at 3 to 5 cm. distance resulted in distinct lenticular opacities which formed within 2 to 14 days following irradiation. This type of opacification is described. (3) Constriction or dilatation of the pupil by topically applied chemical agents did not prevent the formation of lenticular opacities caused by irradiation of a magnitude known to be damaging. (4) In the presence of alloxan-induced diabetes, 33% of the animals in a series developed lenticular opacities in the irradiated eye within 2 to 15 days of exposure to energy previously found subdamaging alone. This energy was less than energies found subdamaging with less severe diabetes.

It is believed that these findings indicate that microwave-induced opacities are caused by both increased ocular temperature and a disturbance of the dynamic metabolic equilibrium of the lens, which may explain the latency of cataract formation following excessive microwave exposures. (Am. J. Opth., July 1952, A. W. Richardson, D. H. Lomax, J. Nichols, and H. D. Green)

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BUPERS NOTICE 1926

5 Aug 1952

From: Chief of Naval Personnel

To: All Ships and Stations

Subj: Extensions of Medical and Dental Officers, U. S. Naval Reserve

1. Purpose. To reduce the anticipated critical shortage of medical and dental officers during the second and third quarters of Fiscal Year 1953.
2. Extensions. It is anticipated that there will be a critical shortage of medical and dental officers during the second and third quarters of Fiscal Year 1953. In view thereof the Bureau of Naval Personnel will normally approve extensions for a period of one month or more from members of the medical and dental corps, U. S. Naval Reserve, who are eligible for release during the period 1 October 1952 to 31 January 1953 inclusive, provided no change of station is involved. These officers may apply to the Bureau of Naval Personnel for extensions even though release to inactive duty orders have been received.
3. Cancellation. This Notice will be considered cancelled as of 1 February 1953.

L. T. DUBOSE
Chief of Naval Personnel

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Subscriptions to the U.S. Armed Forces Medical Journal

Medical Service Corps officers on active duty who wish to receive the Journal may have their names added to the mailing list by addressing a request to the Bureau of Medicine and Surgery attention Code 26.

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The Aviation Medical Acceleration Laboratory

On 17 June 1952, John F. Floberg, Assistant Secretary of the Navy for Air, gave the dedicatorial address at the Aviation Medical Acceleration Laboratory, Johnsville, Pa. Captain R. S. Hatcher, Commander, Naval Air Development Center, Johnsville, Pa. gave the welcoming address at this dedication, which included over 300 prominent persons interested in the various fields of Aviation Medicine. CDR. C. F. Gell, Acting Director, gave a summary on the engineering and physiological potentialities of the human centrifuge and its supporting equipment; as well as a resumé of the research physiologic studies already established, progress made, and those anticipated for the Laboratory within the near future.

The gondola for the human centrifuge constructed by the McKiernan-Terry Corporation, Harrison, N. J., under the cognizance of the Special Devices Center, Office of Naval Research, has been completed and installed on the 50-foot arm. The centrifuge is now being used for the investigation of tolerances to combined acceleration on human subjects at various transverse "G". These subjects are exposed to moderate transverse "G" for short duration, which will be extended to maximum limits as seems advisable, depending upon the changes observed at the lower levels.

The Laboratory continues its affiliation with the University of Pennsylvania. Through this arrangement, the accomplishments and developments of techniques of this Laboratory will be the results of the combined efforts of personnel from both activities. Investigators from the Army, Navy, Air Force, the University of Pennsylvania, and civilian scientists, as well as the equipment available in this Laboratory make for mutual cooperation and research progress.

Progress has been made on all authorized studies and new studies are in their planning stages. Studies on cerebral physiology on monkeys at 12 negative "G" were conducted and the results given at the AeroMedical Association Meeting in Washington, on 17 March 1952. Studies on the action of various problems of aerobic phosphorylation are in progress. The results of these studies utilizing serum albumin indicate a definite metabolic function for this protein that heretofore has not been recognized. Phase I of the study on fluid shifts in small rodents exposed to accelerative stress was completed and the findings also given at the AeroMedical Association Meeting on 17 March 1952. The effects of external pressurization in the legs and abdominal cavity upon the cardiovascular system when applied during exposure to high positive acceleration has been established and the results on 4 subjects will be evaluated. Cardiac output measurements on the ballistocardiograph are completed, and continuous blood pressure recorded from the brachial artery by the use of a Lilly manometer.

Progress has been made on the development and evaluation of the mathematical and mechanical problems in the design and fabrication of cams for the control program on the human centrifuge. Several cams have been designed and fabricated which are now being evaluated. The Bureau of Medicine and Sur-

gery has approved a committee as well as the plans for a radioactivity laboratory and the equipment for this laboratory has been ordered.

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Changes in Premedical Training Proposed

A committee of educators headed by Dr. H. J. Carman, dean emeritus of Columbia College, has been working for 2 years on a study of proposed changes in premedical education.

This study is divided into 2 major sections: (1) A preliminary report on premedical training made public on 21 June 1952, and (2) a report on the medical college level. These studies will be published in about 6 months in 2 volumes totaling nearly 1,000 pages.

In summarizing the conclusions and recommendations of the 2-year study the committee lists the following reforms as necessary: (1) a better-balanced educational program for premedical students. Too much emphasis is being placed on science and not enough on the humanities and liberal arts; (2) a better guidance system for the premedical student should be introduced; (3) a better relationship between the medical school and the liberal arts college should be developed; (4) not enough attention is paid to individual differences between superior and average students. The premedical curriculum is geared to a lock-step program. More attention to the needs of individual students would make a premedical program more flexible; (5) need for better teaching on the undergraduate level; and (6) premedical students should not form a special classification group or be separated from other students in special sciences courses or special section of other courses.

The committee viewed with the "gravest concern" 2 wide-spread practices in college teaching: excessive emphasis on the dogmatic presentation of facts with corresponding underemphasis on the weighing of evidence and the stimulation of critical thought and excessive dependence on methods of teaching and testing which call for the memorizing of facts while neglecting the expression of organized ideas. ("The New York Times", 22 June 1952, B. Fine)

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Enlargement of the Liver Following Whole Body X-irradiation

A marked increase in liver size was observed in adult female Sprague-Dawley rats subjected to large doses of total body X-irradiation. With doses ranging from 400 to 500 r the liver weights at 48 hours postirradiation were 18 to 60% above their respective fasted unirradiated controls. The liver enlargement was not due to edema or to the excessive accumulation of lipids. The increase in liver mass occurred rapidly following irradiation, a significant increase being noted as early as 6 hours following a dose as low as 550 r. At all doses studied the maximum increase in liver mass had occurred by approxi-

mately 24 hours postirradiation. At a total dose of 1,200 r given at dose rates of 6.8, 24.6, 82, and 210 r per minute, no significant differences in the extent of enlargement were noted. Adrenalectomy performed immediately before irradiation with 1,200 r did not prevent liver enlargement. At the same total dose cysteine (950 mg. per kg.) injected intravenously just before irradiation was also ineffective. Liver enlargement was noted in young and old rats, both male and female. (U. S. Naval Radiological Defense Laboratory, San Francisco, Calif.)

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Short Courses Offered by Armed Forces Institute of Pathology

Announcement has been made by the Armed Forces Institute of Pathology that the following short courses will be offered:

1. Pathology of Ionizing Radiation Injuries, 20-24 October 1952
2. Forensic Pathology, 1-5 December 1952

The institute has allotted two (2) places for Navy medical officers in each course. Requests must reach the Bureau of Medicine and Surgery prior to 15 September 1952. Authorization orders ONLY will be provided for those officers approved to attend the course. (Prof. Div., BuMed)

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From the Note Book

1. The Chief of Naval Personnel has announced that Reserve Medical Department officers will receive retirement point credits for attending the Annual Convention of the Association of Military Surgeons, meeting in Washington, D. C., November 17-19, 1952. Reserve Officers of the Medical, Dental, Medical Service, Nurse, and Hospital Corps, not on the Inactive Status List (Public Law 810, 80th Congress), will receive 1 retirement credit for each of the 3 sessions attended, provided that the duration of the meeting is at least 2 hours. (TIO, BuMed)

2. It is now recognized that poliomyelitis is a disease far more widespread than had been generally believed. The polio viruses are spread throughout all the peoples of the world. The annual death rate in Japan, for example, taken over a 21-year period (1923-1943) reached 7.6 per 100,000 against 8.9 for the United States. (W.H.O. Newsletter, July 1952)

3. A radiation detector will measure from 0.02 to 500 roentgens per hour on a single easy-to-read logarithmic scale. Designed for radiation monitoring in the field by civil defense, military, or industrial personnel, the battery-

operated, palm-sized device requires no warmup and has a plus or minus accuracy of 10%. (Science News Letter, 26 July 1952)

4. Protective clothing in atomic or radiologic warfare should be lightweight, nonporous, washable or expendable, and should provide complete body coverage. (Industrial Hygiene and Occupational Medicine, July 1952, F. R. Holden and A. F. Owings)

5. In a symposium on dermatology specialists in the field of dermatology were asked to stress the management of those skin conditions which the general practitioner is most frequently called upon to treat, i.e., acne vulgaris, bacterial infections of the skin, benign tumors, eczema of the hands, superficial infections, and urticaria. The symposium appears in Postgraduate Medicine, July 1952.

6. Part 1 of a research problem concerning the oral characteristics of Guamanians, including the effects of betel nut chewing on the oral tissues, appears in Oral Surgery, Oral Medicine and Oral Pathology, July 1952, CDR. R. G. Gerry, DC, USN; S. T. Smith; and LTJG M. L. Calton, DC: USN.

7. Selected reports from the United Kingdom, United States, and Canadian Combined Conference on Administrative and Scientific Aspects of Food in Civil Defense will be found in Public Health Reports, July 1952.

8. Sickness absenteeism in industry, now reducing the labor force by 2 million man-years, can be cut in half and another million man-years can be added to the work force by careful medical employment teamwork in matching every job applicant to a job he can do well and safely. (Occupational Health, F.S.A., P.H.S., Aug. 1952)

9. Topical anesthesia in bronchoscopy in the light of recent experimental and clinical studies is reviewed in A.M.A. Archives of Otolaryngology, July 1952, H. J. Rubin and B. M. Kully.

10. Accidents complicating pelvic surgery in women are discussed in the New England Journal of Medicine, 10 July 1952, L. E. Phaneuf.

11. The ophthalmologist may often be the first person consulted by the patient with trichinosis because of the acute onset of extremely swollen lids and conjunctiva. (Am. J. Opth., July 1952, M. Croll and L. J. Croll)

12. The clinical features, pathologic findings, operative procedures, and follow-up results are described in a study made of gastrojejunal ulcer from 1940 to 1950. (Surgery, July 1952, V. A. Weinstein and R. Colp)

13. A discussion of the basic problems to be met and an outline of the management of trauma to the thorax is presented in the journal of the Medical Society of New Jersey, July 1952, A. R. Henderson.

14. Clinical investigative experiences with steroid hormones in breast cancer are discussed in Cancer, July 1952, I. T. Nathanson.

15. There are 321 American Board-certified Navy medical officers currently on active duty in the following specialties: Anesthesia 6; Dermatology and Syphilology 13; Gastroenterology 1; Internal Medicine 34; Neurosurgery 3; Obstetrics and Gynecology 26; Ophthalmology 26; Orthopedic Surgery 14; Otolaryngology 28; Pediatrics 13; Plastic Surgery 1; Preventive Medicine and Public Health 15; Proctology 1; Psychiatry and Neurology 38; Radiology 25; Surgery 37; Thoracic Surgery 3; Urology 13; and Pathology 24: Of the 321, 14 are Naval Reserve officers on active duty. There are 22 Naval Dental Corps officers currently on active duty in the following specialties: Oral Surgery 8; Prosthodontia 13; and Oral Pathology 1. (TIO, BuMed)

16. Naval medical and dental officers recently certified in their specialties by American Boards are: American Board of Surgery; CDR. Bruce R. McCampbell, MC, USN, CDR. Shakeeb Ede, MC USN; American Board of Ophthalmology, LCDR. Thomas E. Atkinson, MC, USN; American Board of Psychiatry and Neurology, LCDR. Richard B. Leander, MC, USN; American College of Surgeons, CAPT. Morris M. Rubin, MC, USN; American Board of Oral Surgery, CAPT. Merritte M. Maxwell, DC, USN, CAPT. Ralph W. Taylor, DC, USN, CDR. James L. Bradley, DC, USN, CDR. Roger G. Gerry, DC, USN, CDR. Harold G. Green, DC, USN, CDR. Theodore A. Lesney, DC, USN, and CDR. Arthur S. Turville, DC, USN; American Board of Prosthodontics, RADM. Alfred W. Chandler, DC, USN, CAPT. William W. Fowler, DC, USN, CAPT. Arthur R. Frechette, DC, USN, CAPT. Alvin H. Grunewald, DC, USN, CAPT. Stephen T. Kasper, DC, USN, CAPT. Frank M. Kyes, DC, USN, CAPT. Benjamin Oesterling, DC, USN, CDR. Joseph E. Josephson, DC, USN, CDR. John V. Niiranen, DC, USN, and CDR. Harold R. Superko, DC, USN.

17. Three cases of fibrosarcoma of the bronchus, diagnosed by bronchoscopy and treated by resection, are reported in the Journal of Thoracic Surgery, July 1952, CAPT. C. F. Storey, MC, USN.

18. Fifteen cases of acanthosis nigricans are reported and analyzed in A.M.A. Archives of Dermatology and Syphilology, July 1952, H. O. Curth.

19. A fuseholder that takes standard panel size fuses has a built-in neon light bulb that lights up instantly when a fuse blows out, thus making it easy to spot the bad fuse. (Science News Letter, 19 July 1952)

NAVMED P-1328

"A limited number of copies of "Treatment of Casualties from Chemical Warfare Agents", NavMed P-1328 are available from the U. S. Naval Supply Depot, Scotia 2, N. Y. This publication has been distributed to all activities having a medical officer; however in order to acquaint all medical personnel with the standardized treatment for casualties resulting from chemical warfare agents and to provide material for instruction in self aid, all naval activities not having a copy of this publication, may order one from the U. S. Naval Supply Depot, Scotia, N. Y. In view of the very limited number of copies available, only one copy of this publication will be allowed each naval activity." (Special Weapons Defense Div., BuMed)

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BUMED NOTICE 5215

18 July 1952

From: Chief, Bureau of Medicine and Surgery

To: All Holders of the Manual of the Medical Department

Subj: Manual of the Medical Department, disposition of 1945 revision

1. Purpose. This Notice provides for the disposition of the 1945 revision of the Manual of the Medical Department.
2. Disposition of 1945 Revision. Having been superseded by the current edition (size 7 7/8" x 10 1/4") the 1945 revision (size 6 1/4" x 9") of the Manual of the Medical Department should be disposed of locally. If desired, copies may be retained for historical reference use.
3. The Current Edition. The current edition of the Manual is now complete, except for the title page and the table of contents (which are being printed for distribution in the near future) and chapter 19 (which is now in the clearance process and which will be forwarded to addressees without request when it is finally approved and printed).
4. Cancellation. This notice is cancelled after above indicated disposition action has been taken

H. L. Pugh

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The printing of this publication has been approved by the Director of the Bureau of the Budget, June 23, 1952.

BUMED NOTICE 6010

21 July 1952

From: Chief, Bureau of Medicine and Surgery
To: Commandants of Naval Districts and River Commands
and Commanding Officers, all Naval Hospitals
(except Yokosuka)

Subj: Length of patient stay

Ref: (a) BUMED Circular Letter No. 51-108 of 19 July 1951

Encl: (1) Blank form for reporting discharges by day of week

1. The purpose of this Notice is to obtain data to assist in justification of budget estimates for fiscal year 1954. Each Commanding Officer is requested to forward to the Bureau (Attn: Comptroller Division) a brief narrative report of action taken to reduce length of patient stay, of action planned during the current fiscal year and of recommended improvements. The report is to reach the Bureau no later than 15 Aug 1952. This notice shall be cancelled when the report has been forwarded.

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BUMED INSTRUCTION 5712.1

21 July 1952

From: Chief, Bureau of Medicine and Surgery
To: All Naval Hospitals

Subj: Mutual Defense Assistance Program policy for hospitalized
or disabled trainees

Ref: (a) OpNav ltr Ser 2254P27 of 18 Jun 1952

1. Purpose. This Instruction is issued to inform naval hospitals of proper disposition of Mutual Defense Assistance Program trainees physically unfit for training.
2. Policy. The following policy as set forth in reference (a) is established for the administration of Mutual Defense Assistance Program grant aid trainees who require hospitalization or are disabled while training in the United States:

“a. Mutual Defense Assistance Program grant aid trainees who have been selected by their country for training are presumed to be in good physical condition and free from communicable diseases as a prerequisite to selection. If upon arrival it is discovered that the trainee cannot qualify for training for reasons of physical and/or mental conditions and will require

more than nominal medical treatment before entering training, the trainee will be returned to his country immediately or as soon thereafter as his condition permits travel.

"b. When the trainee requires hospitalization or is disabled after starting a course of instruction, he will be returned to his home country as soon as practicable when in the opinion of U. S. medical authorities the hospitalization or disability will prevent continuation of the training for a period in excess of ninety (90) days."

3. Action to be Taken. When it is found that it will be necessary to return Mutual Defense Assistance Program trainees to their home countries, it is directed that you promptly notify Chief of Naval Operations, OP-27.

H. L. Pugh

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SECNAV NOTICE 10110

22 July 1952

From: Secretary of the Navy
To: All Ships and Stations

Subj: Ration values; cancellation of ALNAV concerning

Ref: (a) BUMED Cir Ltr No. 52-57 of 30 June 1952 NDB subj: Hospitalization and subsistence rates for fiscal year 1953

1. Purpose. This Notice cancels ALNAV 51-51 (NDB Jan-Jun 1951, 51-431, p. 30). The current instructions applicable to naval hospitals have been incorporated in reference (a).

2. Cancellation. This Notice is cancelled when the appropriate action has been taken.

H. R. ASKINS
Acting Secretary of the Navy

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Navy Medical School, National Naval Medical Center, Bethesda 14, Maryland, giving full name, rank, corps and old and new addresses.

BUMED INSTRUCTION 5070.1

22 July 1952

From: Chief, Bureau of Medicine and Surgery
To: All Medical Department Activities and Facilities
Subj: The Armed Forces Medical Library

1. This Notice cancels BUMED Cir Ltr 52-45 and for the information of the addressees quotes pertinent paragraphs of the Department of Defense Directive 20.33-3 which established the Armed Forces Medical Library.

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BUMED INSTRUCTION 5450.1

25 July 1952

From: Chief, Bureau of Medicine and Surgery
To: Distribution List
Subj: Field Branch, Bureau of Medicine and Surgery; mission of
Ref: (a) SecNav Notice 5450 Ser 2273P21 of 14 Jul 1952

1. This Instruction cancels BUMED Cir Ltr 48-75 of 7 July 1948. Article 25-24(1) MMD will be cancelled. The Instruction sets forth the mission, tasks and liaison of the subject branch.

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BUMED NOTICE 6470

29 July 1952

From: Chief, Bureau of Medicine and Surgery
To: Activities utilizing Photodosimetry Program
Subj: Photodosimetry Program; calibration curve for
Ref: (a) NavMed P-5005, "Photodosimetry Manual"
(b) BuMed Ltr BUMED-74-bmb, M8-1/NN, Ser 5201 dtd 25 Jun 52
Encl: (1) Calibration Curve for DF-7 Emulsion #52486064546,
calibrated July 1952

1. Purpose. The purpose of this Notice is to distribute to all pertinent naval activities the calibration curve for emulsion #52476064546.

2. Cancellation. This Notice is cancelled after having served its purpose.

Training Courses for Volunteer Naval Reserve MC, MSC,
and HC Officers in Malariology and Insect Control

Training courses of 2 weeks' duration for Volunteer Naval Reserve MC, MSC, and HC officers in Malariology and Insect Control are scheduled to convene on the first and third Wednesday of each month at the U. S. Navy Malariology and Mosquito Control Unit, U. S. Naval Air Station, Jacksonville, Fla., during the second quarter, fiscal year 1953.

The purpose of these courses is to provide information and techniques to be employed in insect control and practical field experience which are not readily available to Volunteer Naval Reserve MC, MSC, and HC officers in their civilian occupation, yet invaluable to their function in the event of mobilization.

The uniform of the day is service dress, khaki, or khaki working. It is desirable that all personnel have service dress blue uniform and civilian dress available while on duty. Meals and sleeping quarters will be available at the Bachelor Officers' Quarters for those officers who desire such accommodations. Motor courts are usually available near the Naval Air Station for use of personnel accompanied by dependents.

The 1st, 3rd, 4th, 6th, and 9th Naval Districts, and Potomac River Naval Command have been assigned quotas for these courses for the second quarter, fiscal year 1953.

Inactive Volunteer Reserve MC, MSC, and HC officers are encouraged to take advantage of the opportunity to attend these courses on active training duty orders in a pay status. Officers who desire to attend these courses should submit their request to the Commandant of their home naval district at the earliest practicable date. (Reserve Div. BuMed)

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BUMED NOTICE 5215

8 Aug 1952

From: Chief, Bureau of Medicine and Surgery

To: All Ships and Stations

Subj: BuMed Circular Letters; cancellation of several

1. The following BuMed circular letters are cancelled: 45-171, 46-53, 46-122, 46-126, 47-9, 47-17, 48-20, 48-76, 48-77, 49-103, 49-143, 49-159, 50-19, 50-49, 50-87, 51-45, 51-84, and 51-93.

2. This notice is cancelled after compliance.

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AVIATION MEDICINE DIVISIONOperational Aviation Medicine

Aviation medicine may be regarded as a form of industrial medicine having the specific purpose of safeguarding the lives of those who fly. The flight surgeon, just as his counterpart in industry, is largely concerned with the prevention of accidents, which, in the last analysis, represents the greatest hazard to flight personnel. In training for the specialty of aviation medicine, the physician attends courses consisting, in part, of material culled from many branches of medicine. The determination of these study requirements evolved essentially from the cumulative experiences of those engaged in this type of practice. The resultant diversified medical background is unquestionably fundamental.

However, there is another approach to the role of the flight surgeon that is particularly important to those who are part of active operational units. This viewpoint is based on a consideration of the aviator and the basic factors which cause him to remain free of unfavorable incidences once he accepts the control of an aircraft. For purposes of discussion we may resolve this consideration into the various occupational aspects of flying.

In a sense we may look upon the life of an aviator as being suspended by a vital chain composed of four large links. Any factor which would contribute to a weakening of one of these links would tend to place the pilot in jeopardy. By virtue of his training and through an understanding of the composition of this chain, the operational flight surgeon may often detect an incipient break and institute preventive measures.

The initial link in the aviator's chain of life is the aircraft itself. The history of aviation is replete with the names of famous aviators whose deaths were undoubtedly due to basic defects in the airplane which they were flying. These occurrences often provided essential information as the quest for more speed and higher altitudes imposed greater stresses on aircraft and power plants. But even today, with the tremendous capabilities of the industry, new aircraft are occasionally delivered to military units and after a period of usage, changes are required in engines or the structure of the airplane in the interests of flight safety. Often, the pilot is quick to express his satisfaction or dissatisfaction with a new plane. These attitudes make it incumbent upon the flight surgeon to learn as much as possible concerning the performance and flight characteristics of the aircraft assigned to his activity.

During the last war a new single-engined fighter of unusual design and possessing a greater military potential than comparable planes, made its appearance in Marine Aviation. The first few months of its operational use saw

an unusually high number of accidents, many fatal. I can recall a young pilot whose anxiety was so great prior to checking out in this airplane that he remarked that the experience took about 10 years off his life. And years later, an experienced naval aviator informed me that it took 50 hours of concentrated flying in this type aircraft before he felt comfortable in it. Such reactions unquestionably affect flight proficiency by increasing psychomotor tension.

There are certain types of planes now in use that are liked by practically everyone who flies them. Most often, they have a well laid-out cockpit, are versatile in performance, rugged in construction, and have few unfavorable characteristics. These planes frequently will allow remedial action when inadvertently entering an unsafe altitude or will, by their inherent stability, resist a breach of flight technique before the occurrence of an accident. We may term such aircraft "forgiving." On the other hand, there are those which may be called "unforgiving" aircraft. Pilots well know that an approach to a stall in certain types predisposes to a vicious spin, or there may be a tendency in others for a wing to drop abruptly. It has been said, as another example, that there were two classes of pilots in the Navy during the early days of the last war, those who had ground-looped the Wildcat, and those who were going to ground-loop it. This exaggeration probably owes its origin to the tendency, in this airplane, for one wing to drop before the other as lift decreased during the landing runout. This was usually misconstrued as a beginning ground-loop toward the side of the low wing and the pilot would turn in the opposite direction believing it to be corrective action but actually he would precipitate a ground-loop which was virtually impossible to stop once it had started. We know, also, of other "unforgiving" aircraft in which a crash was usually fatal because of inherent structural weaknesses or because certain cockpit instruments became lethal weapons under high decelerative forces. The rolling characteristics of some aircraft following the rapid application of power is well-known and wave-offs often became crashes because of this tendency.

In any case, "unforgiving" aircraft are usually high on the list of accident statistics. Often, many of these accidents are termed "pilot error" but a basic analysis may point to the fact that those planes require a greater measure of alertness and proficiency on the part of the pilot than do "forgiving" aircraft. Add to already increased psychomotor tension distracting elements such as unfavorable weather, heavy night traffic, or a rolling carrier deck, and the conditions are provided for a lapse in memory or a break in a habit pattern with the resultant "pilot error" accident.

Anxiety or mental conflicts may actually produce frank psychomatic symptomatology with an "unforgiving" aircraft type as the basic component. A case in point was that of a young ensign who was assigned to a fleet fighter squadron temporarily based ashore. He was referred to the flight surgeon because he had been dropped from the morning flight schedule on a few occasions at his own request presumably because of an upset stomach. Physical examination was negative. Upon questioning, the pilot stated that virtually every morning he had "butterflies" in his stomach and that sometimes he had

actually vomited. He denied eating breakfast on weekdays but did admit that on Sundays he usually ate a large breakfast with a good appetite. Upon being temporarily grounded his symptoms disappeared. The pilot's flight record in training and in the squadron was excellent. It was elicited that his best friend was killed in a Navy fighter 1 week before he was to solo the same type aircraft in flight training. Later, his carrier qualification was completed without incident but he stated that the same symptoms were present in almost the same degree. After seeing another friend killed in his own squadron as the result of an aircraft accident, he had a severe exacerbation. The fact that he had a fine flight record with a desire to make good evidently produced a conflict with a subconscious anxiety about flying this type airplane. He believed that he would be able to fly other types without any reaction when this explanation was presented but when this was regarded as not feasible, he was quite willing to be removed from a flight status after which he had no recurrences.

The second great link in this vital chain has been receiving considerable emphasis and is being pursued with much energy. It is basically pilot training. Certainly, it is axiomatic that the finest aircraft in the world will not perform its assigned function unless the pilot is thoroughly capable of utilizing its full potential. Military expediency has dictated the need for high-flying efficient gun platforms and new aircraft with higher tactical ceilings are entering operational units regularly. No one doubts the capabilities of these new aircraft to ascend to extreme altitudes; the engineers and test pilots have proved that. To get a military pilot to take an aircraft to these altitudes and survive poses a distinct problem in training.

It is in this regard that the operational flight surgeon has a significant responsibility to pilots in his unit. A comprehensive reindoctrination in the aeromedical aspects of flight must be presented at intervals in order to emphasize the correct use of personal equipment as a buffer against the insidious hazards of flight. By integrating the training program of the flight surgeon whose concern centers on means for pilot survival with those pertaining to matters relating to aircraft control, navigation, gunnery, and the like; the efficiency of the pilot in terms of his ultimate function is materially increased.

The initial indoctrination of the pilot in the use of oxygen and other personal equipment during flight training often does not serve its intended purpose because of the student's preoccupation with his intensive ground school courses and the pressure of rigidly controlled daily flights. Nevertheless, this introduction serves as a valuable basis for subsequent information together with the practical experience he received while at an active operational activity. A fighter pilot, because of frequent flights to high altitudes, feels a compelling personal reason for absorbing as much information on altitude as possible.

Some military pilots who fly one type of aircraft day in and day out are prone to look upon their planes and various aeromedical considerations with some complacency. When this state of mind exists, conditions arise which

may result in a serious accident. For this reason aeromedical reindocination to active pilots should be dynamic with new presentations being offered from time to time rather than presenting a particular course which, when completed, allows the pilot to forget its content after a time. Through the use of various training devices, lectures, and motion pictures, some phase of the aeromedical aspects of flight may be repeatedly introduced. Furthermore, new equipment demands training and it often becomes necessary for the operational flight surgeon to become acquainted with new equipment so that he may institute suitable training in its use.

As a corollary to the use of equipment there is a responsibility for its maintenance. Certainly, its importance places maintenance as the third link in this hypothetical chain. Accidents have occurred, not as a result of the aircraft, nor because of inadequate training, but rather because a specific piece of essential equipment was not properly maintained. Ordinarily, responsibility for this function is delegated to individuals whose duty is the upkeep of aircraft. However, a narrow point of view is frequently held which over-emphasizes aircraft availability or how to "keep them flying." Since training in the use of such equipment as oxygen systems falls upon the flight surgeon, maintenance personnel often do not give this system the attention it merits. Such an exclusion is easily understood since oxygen equipment does not affect the flyability of the aircraft per se. All too often the result is that oxygen systems and other personal airborne equipment are not checked as required and maintenance facilities for this material are frequently lacking or inadequate.

Inclusion of maintenance as a link in this chain does not imply that the flight surgeon should undertake this responsibility exclusively. However, because of his interest in the proper use of this gear, the flight surgeon should more or less act as supervisor and insist that proper maintenance facilities are available and that suitably trained personnel are on hand to conduct required procedures.

The oxygen system is singled out above other equipment because of its vital role in pilot survival. Much information has been promulgated regarding the use of oxygen but few aviators are sufficiently interested in it to understand the maintenance requirements involved. Most pilots are quick to urge an engine check when an allotted time is reached but there are few who are aware that the oxygen regulator should be removed for routine examination. And yet, a major defect in this device at altitude may mean a fatality. This thought alone should make the operational flight surgeon insure that adequate maintenance procedures are being carried out within his unit.

With a demonstrable interest on the part of the flight surgeon, pilots will not hesitate to report any discrepancies in the function of this equipment to him. Occasionally, these difficulties are easily remedied by simple adjustments, such as repositioning one of the valves in an oxygen mask. But sometimes faulty operation is caused by a design defect. By reporting these factors to the proper agencies, hazardous conditions may be ultimately remedied.

The final essential factor which contributes to the safety of flight personnel is physical fitness for flight. This important link has always been regarded as a prime function of the flight surgeon. It is within the operational activity that practical use may be made of his extensive training. Through an understanding of the intended mission of a pilot, the flight surgeon may consider the physiologic changes which may be encountered and evaluate the aviator's fitness from that viewpoint. Slight deviations from normal, such as an incipient upper respiratory infection, are often recognized early and a judicious use of the grounding slip may obviate such conditions as aerotitis media or aerosinusitis.

Because of the close association of the operational flight surgeon with the pilots in his unit, he is in a position to practice medicine with an insight usually reserved for a family physician or general practitioner. Often he is looked upon as an advisor, and personal problems are frequently presented to him in confidence particularly when a unit is on detached duty or at sea. Timely advice to the young pilot on medical matters affecting his family go a long way towards increasing his stature as a physician. Reassurance to the junior officer expecting his first child, for example, gains a true friend. The ramifications of the flight surgeon's services with regard to assuring that the pilots under his care are good flight risks at all times are legion and their importance cannot be overestimated.

A flight surgeon with an active operational unit, therefore, has a unique opportunity to evaluate flight personnel through a consideration of the vital chain on which their lives depend. By knowing something of the flight characteristics of the aircraft in his activity, considering the attitudes of each pilot towards his type airplane, aiding in aeromedical training, insuring that proper maintenance procedures are being carried out, and ascertaining that each pilot is a good flight risk, the operational flight surgeon may significantly contribute to the combatant readiness of his organization. (J. Aviation Med., July 1952, CDR. S. I. Brody, MC, USN)

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Notice to all Flight Surgeons

Since 1948 over 800 naval personnel have been indoctrinated on the human centrifuge at the Naval Air Station, Pensacola, Fla. Because such indoctrination has become routine in certain fields of naval aviation, it has been considered desirable to note such indoctrination in each individual's health record. Since 1 May 1952 such entries have been made routinely. Personnel who were indoctrinated on the centrifuge at the Naval Air Station, Pensacola, Fla. prior to that time may have an entry made in their health record. Cognizant medical officers are requested to forward to the Acceleration Unit, School of Aviation Medicine, Naval Air Station, Pensacola, Fla. the following information concerning personnel who were indoctrinated on the centrifuge

prior to 1 May 1952: Name, rate or rank, serial or service number; Birth-place and date; and current duty station address.

Upon receipt of this information the School of Aviation Medicine will verify the fact that the indoctrinee was trained on the centrifuge and authorize the cognizant medical officer to make appropriate entries in the indoctrinee's health record.

Entries will be made on the Aviation Medical Abstract Record Navmed H-9 in one of the spaces provided under "Summary of Physical Examinations for Flying." Details of consequence in excess to that which can be entered in this limited space should be recorded on Navmed H-8 of the indoctrinees health record.

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Nominations for Change in Duty Since 1 June 1952

Commander (MC) USN: R. R. Bonar from MCAS, Cherry Point to U.S.S. Monterey; J. C. Pinto from FMF Lant, MCAS, Cherry Point to NAF Port Lyautey; C. N. Scott from NAS Willow Grove, Pa. to MAW 1, El Toro, Calif.; E. G. Hurlburt from U.S.S. Leyte to MCAS, Quantico, Va.; J. P. Dobson from MCAS, Quantico, Va. to U. S. S. Leyte; J. A. Niforopulos from NAS, Alameda, to U.S.S. Tarawa; J. A. Fusco orders to NAF, Port Lyautey, cancelled.

Lieutenant Commander (MC) USN: R. L. May from U.S.S. Monterey to NROTCU, Philadelphia, Pa.

Lieutenant (MC) USN: W. C. Folsom from FAW 1 to NAAS, Barin Field, Foley, Ala.; W. L. Erdbrink from CVG-15 to ComAirPac; D. G. Doane from NS Midway Island to NAS Anacostia; T. A. Beck from NAS Anacostia to U.S.S. Gilbert Island; C. W. Schmidt from NAS Patuxent River to CVG-4; E. J. Vann, Jr. from NAS Pensacola to VP-40; A. J. Guida from NAMC Philadelphia to MCAS Quantico, Va. (TAD); C. N. Hickman from NAAS Barin Field, Foley, Ala. to NARTU, NAS Memphis; W. F. Bennett from NH San Diego to NAS Willow Grove, Pa.

Lieutenant (junior grade) (MC) USN: J. R. Titus from SAM to FAW 2; J. A. White, Jr. from NH Corona, Calif. to NAS San Diego; J. C. Barnett from ComAirPac to CVG-15; J. D. Bridgers from CNABATRA to CNAVANTRA; J. J. Murphy from U.S.S. Midway to U.S.S. Block Island; H. D. Luck from NARTU Memphis, Tenn. to MAW 2; H. J. McLaren from FASRON 114 to NAAS El Centro, Calif.

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Defects Noted on SF-88's (Report of Medical Examination), (Report of Medical History) Submitted to BuMed: for June and July 1952

Omissions.....	197
Excess copies	1,179

Lack of copies 80
 Carbon copies not legible 27
 Carelessness in recording results 48
 Flight specialty not recorded 67
 Flight time omitted 79
 Not fully explaining dental defects of NavCad applicants 3
 Not recording C. E. R. and improperly placing pulse in spaces 32
 Refractions not properly recorded 8
 Not leaving right side in column 73 for BuMed endorsement 98
 Failure to state aviator's service group in recommendation. 119
 Not clarifying or going into enough detail regarding medical defects . . . 23
 No reason given for hospitalization 5
 Failure to mention disqualifying defects on SF-89 (Medical History Sheet). 13
 Failure to submit SF-89 (Medical History Sheet) 19

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Attention Flight Surgeons

The Aviation Psychology Branch of the Aviation Medicine Division finds that 1 out of every 5 sets of Aviation Cadet Selection Tests are being submitted to BuMed with gross errors in scoring. There are stations that exceed 40% errors in tallying these scoring sheets.

Sheer negligence in failing to double check the score by recounting each test sheet is the causative factor in most of these scoring errors. These errors create additional work for personnel in BuMed and embarrassment to those who submit the tests from the field. In some instances injustice to the applicant is created. It is recommended that each test sheet be counted and scored by two parties independently of each other.

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A Student Meets "G"

The following excerpt of a letter from a student undergoing flight training at Pensacola should prove of interest to flight surgeons in that it graphically presents the value of correct technique in overcoming the effects of moderate "G" forces.

"Dear Folks: Well, a lot has happened today, but let me start with yesterday. It is funny that I should just get your letter now asking if I ever got sick while flying acrobatics. Yesterday I had my first acrobatic hop. We, my instructor and I, went up and he introduced the loop to me. Then he asked me to do one. He said it was very good. So, he said he would show me an Immelman turn. On this maneuver you dive down until you get 175 knots which

is pretty fast. Then you pull up until you are upside down going the other way. Then you flip the plane over and you have just done an Immelman. Well the first one was okay, but the second one blacked me out. My instructor later told me that I only pulled about 3 "G's" in the maneuver and said I was not tensing up like I should to keep from blacking out. I was holding my breath which was exactly the wrong thing to do. You are supposed to tighten up your stomach muscles but keep on breathing. So, I went over to sick bay to talk to the flight surgeon about "G". He said he could talk to me about it, but it would be better for me to go over to the Acceleration Unit at Mainside. So this morning I hopped into a Navy bus and went over to see a gadget called the centrifuge.

At first appearance it looks like a fugitive from Glen Echo Amusement Park. There is a long arm and at the end is a chair. Then they spin you around at a certain rate and record the number of "G's" you pull. Well my instructor said I went out at 3 and today they gave me more than the average which is 5.2, and I took 5.5 which is pretty good. There is nothing dangerous about it because they had instruments taped all over me recording data, and as soon as I had taken enough they stopped. Anyhow, all I needed was someone who knew to show me how to tense the right way."

Inasmuch as there are aircraft which do not possess facilities for anti-blackout equipment, it would be appropriate for flight surgeons to re-emphasize the proper straining method of resisting the effects of "G".

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Permit No. 1048

OFFICIAL BUSINESS

WASHINGTON 25, D. C.

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, \$300