TABLE OF CONTENTS

Circular Letters:

*   *   *   *   *   *

NOTE

The Next Course in the Medical Aspects of Special Weapons and Radioactive Isotopes for U. S. Naval Reserve Medical and Dental Officers at the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland:

27-31 March 1950

Resuscitation in Cessation of the Heartbeat: A sufficient number of patients have been returned to normal health following cardiac resuscitation to make it evident that effort expended in that direction is worth while. It is equally evident to those interested in this field that if the occasional patient whose heart is in asystole is to be resuscitated, the operating team involved must act quickly, according to a preconceived plan. It is unlikely that any patient will be saved by a surgeon who previously has not thought out his plan of action.

When a patient develops sudden cardiac arrest, the greatest problem is that of speed in making the diagnosis and instituting treatment. The brain must not be deprived of oxygenated blood for more than from 3 to 4 minutes. Therefore, within this short period of time, the surgeon must produce an adequate blood flow by cardiac massage, and the anesthetist must ensure oxygenation of the blood by adequate ventilation of the lungs.

The cause of cardiac asystole has a great deal to do with the prognosis. Success can seldom be expected unless the emergency arises in the operating room. Even then success is unlikely when dealing with a patient with severe myocardial injury.

A favorable situation for cardiac resuscitation is that of a patient with a normal heart who has received an overdose of an anesthetic; the problem is simply that of producing artificial circulation and respiration until enough of the anesthetic agent is removed, or destroyed, to allow the heart to start beating again. When cardiac arrest or ventricular fibrillation has occurred incident to anoxia, the brain may have been damaged considerably before cardiac action ceased. It is sometimes difficult to account for sudden cardiac arrest when the heart has no demonstrable lesion and anoxia or an overdose of an anesthetic does not appear to be a contributory factor. It has been thought that reflex phenomena (vago-vagal reflexes) are responsible. In such a situation the heart will usually resume beating rather easily, and if the time interval is not over 3 minutes, the prognosis is good.

Delay in diagnosis is the chief cause of failure. The anesthetist must maintain constant observation of the patient if he is to notice asystole the moment it occurs. Having noticed the absence of a pulse or blood pressure, the question always arises concerning whether the heart is beating so feebly that it cannot be detected, or whether the heart is in standstill or ventricular fibrillation. In many instances a fatal delay is caused by futile efforts to confirm the diagnosis before proceeding with the proper treatment. If the surgeon happens to be operating in the vicinity of the heart or a large artery he may immediately confirm the diagnosis by putting his hand directly on the heart or large artery; in the abdomen his first reaction should be to feel the heart through the diaphragm. Auscultation of the chest is not apt to be helpful when

the pulse and blood pressure are not obtainable. The authors believe that the surgeon should take the point of view that opening the thorax to feel the heart is a diagnostic procedure, and therefore that when the patient's pulse and blood pressure suddenly cannot be obtained, the chest should be opened immediately without losing valuable time attempting unreliable diagnostic procedures.

Once the decision has been made to open the chest, the surgeon should be prepared to do it with the greatest dispatch. Every surgeon therefore should give some thought concerning the quickest and easiest method. Only a pair of gloves and a scalpel are needed. The surgeon should then have his hand on the heart in from 10 to 15 seconds. Skin antiseptics and sterile draperies are re- finements, when available, but their absence should not cost the patient his life. The incision should be made in the left fourth interspace from about the edge of the sternum to the posterior axillary line. Because there is no bleeding the incision can be carried quickly through the chest wall and pleura. The surgeon can then readily put one hand between the fourth and fifth ribs to feel the heart. The diagnosis will be immediately apparent. If arrested the heart will be still and if in ventricular fibrillation, it will feel like a bag of worms.

In the presence of cardiac asystole the problem is one of producing ade- quate blood flow by cardiac massage and adequate oxygenation of the blood by artificial ventilation of the lungs. Adequate respiration can be maintained with an anesthesia machine by manual compression of the breathing bag. A tightly fitting face mask is satisfactory. It is not wise to take time to insert an endo- tracheal tube until the patient is again well oxygenated. One hundred percent oxygen should be used. If the emergency should arise out of the operating room, the bag and mask technic, or the Kreiselman bellows resuscitator, can be used. Until they are available the patient's lungs should be ventilated by the mouth to mouth technic.

As soon as the surgeon puts his hand on the heart and finds it is not beat- ing, he should start compressing it rhythmically. If a rib spreader is not im- mediately available he should divide the fourth and fifth cartilages with a knife or scissors in his left hand as he compresses the heart with his right hand, in order to give better exposure and prevent the ribs from pressing against his hands. Even after this the rib spreader is of great help. Following cardiac massage a few open vessels will begin to bleed and must be caught as soon as hemostats are available. A difference of opinion exists concerning the rate at which the heart should be compressed. Most writers recommend from 20 to 40 times a minute, in order to allow the ventricles to fill adequately; a few have suggested a normal rate. In studies recently carried out by the authors in dogs, it was found that in all instances the blood flow increased as the rate of com- pression was increased regardless of whether the heart felt full or empty. The authors therefore believe that the heart should be compressed as rapidly as possible, up to 120 times per minute. The fatigue of the operator makes a rate

of 120 times per minute impossible for more than a few minutes whereas he can continue for a long time at from 60 to 80 times per minute. If there are 2 or more operators who can take turns, a faster rate may be constantly maintained. It was found in the laboratory that some practice was required to produce an effective blood flow by cardiac massage. The dog's heart can be compressed most effectively by placing the thumb in front and the fingers behind, or the thumb and index finger in front and the other 3 fingers behind the heart. It was found that the blood flow produced by compressing the heart against the arterior chest wall was only about one half as great as by the above method. Only one fifth as much blood flow could be produced by compressing the heart through the diaphragm with one hand in the abdomen. The amount of blood flow produced by artificial respiration alone was too small to be measurable by this technic. Any hope that artificial respiration will produce an effective blood flow should be abandoned. A small human heart may be compressed with one hand, as in the dog. The usual adult heart can be more effectively compressed, with less effort, by placing one hand in front and one behind the heart.

It was found in the laboratory that the filling of the heart is very important in producing an effective blood flow even though it was not profitable to wait for it to fill between cardiac compressions. The cardiac output varied directly with the rate. Nevertheless the cardiac output could be greatly increased by rapid transfusion of blood, plasma or plasma substitutes. When intravenous fluids were given rapidly the heart could be felt to fill more completely and the cardiac output was found to be increased greatly even though the compression rate remained the same.

In most instances the heart will resume beating fairly soon if it is going to do so. Occasionally it may start up after a prolonged period of artificial respiration and circulation. In such instances it may be best to divert for a while a good part of the blood flow to the brain by occluding the aorta.

The authors feel that no drugs are helpful in getting the heart to start beating again. Once the heart has started, epinephrine may be useful in increasing the tone of the cardiac muscle and the effectiveness of its contraction. The authors have seldom used it. It does increase the probability of ventricular fibrillation.

Procaine may be useful to decrease the likelihood of the development of ventricular fibrillation, and in restoring normal rhythm in the event of ventricular fibrillation. The authors use it routinely. If, when the thorax is opened, the heart is found in ventricular fibrillation, or if it should develop during the cardiac massage, the problem takes on another aspect. The usual causes of ventricular fibrillation are anoxia, mechanical trauma, electric shock, and drugs which increase the irritability of the heart. Clinically, anoxia results commonly from coronary occlusion, or respiratory obstruction during anesthesia. The

heart may be stimulated by manipulation during many intrathoracic operations but ventricular fibrillation has occurred most commonly during operations upon the heart and pericardium. Local and intravenous procaine have been shown both experimentally and clinically to protect the heart against irregularities resulting from mechanical stimulation.

In rare instances ventricular fibrillation has reverted to normal rhythm spontaneously. In some the use of drugs may cause reversion, as happened recently in one of the authors' patients. Nearly always, however, countershock therapy, developed by Wiggers and by Beck and Mautz must be employed. This method of treatment is based on the observation that passage of a strong current through the heart will cause a simultaneous contraction of all the incoordinated, fibrillating fibers, and relaxation follows. The heart is then in standstill. In animals, the spontaneous heartbeat resumes after a short period of cardiac massage. In the patients' hearts defibrillated by the authors, the spontaneous heartbeat has begun after a short interval of standstill.

Before defibrillation is attempted, anoxia must be overcome by cardiac massage and artificial ventilation of the lungs with 100 percent oxygen. Three cubic centimeters of 2 percent procaine are injected into the right ventricle and an equal amount into the pericardial cavity unless procaine has previously been given intravenously. The electrodes are then placed on each side of the ventricles and an alternating current (60 cycles) of from 1 to 1.5 amperes is passed through the heart for less than a second. Repetition of the shock may be necessary. The strength of the current is of importance, for it has been shown that, in animals, 0.4 amperes for 5 seconds will cause fibrillation, whereas 0.8 amperes or more will stop it. A current of 0.8 amperes will not cause fibrillation and 0.45 amperes will not stop it.

Although cardiac arrest and ventricular fibrillation are uncommon, they do occur from time to time on any active surgical service. During the past 2 years, since the authors' previous report, they have had 6 patients whose hearts have been resuscitated, at least temporarily. Four of these occurred in the operating room. Three of the patients are alive and well. The fourth was decerebrate and died on the thirty-ninth postoperative day. Two who developed cardiac asystole outside the operating room died within 48 hours after cardiac resuscitation. In 2 other instances cardiac massage was attempted under circumstances which appeared all but hopeless. Spontaneous heartbeat was not restored and these cases are not described. (Surg. Clinics N. America, Dec. '49, J. Johnson and C. K. Kirby)

* * * * * *

X-ray Therapy in Regional Enteritis: The first patient with regional en-
teritis to receive x-ray therapy at the Mayo Clinic was a woman who had had a
resection elsewhere and whose general condition was very poor. This was in
September 1944. After a course of treatment there was a remarkable change
for the better.

A preliminary report of results from this treatment in 20 patients was
presented in October 1948. Other patients had been treated by that time but
they had not been observed long enough for that preliminary report. The main
criteria for the selection of cases were (1) that the disease was severe and
(2) that usually surgical treatment was not feasible or advisable. Of the 20
patients, 12 had undergone operation previously, having had from one to 3 re-
sections. In 7 of the cases, although surgical treatment was considered, the
disease was so severe that roentgen-ray therapy was applied instead of opera-
tion. One of the patients underwent operation after x-ray treatment for another
condition. In those cases in which operation had been performed previously,
the most common roentgenologic finding was extensive recurrence in the re-
gion of the anastomosis. Roentgenographic findings for the patients who did not
undergo operation showed involvement of from 1 to 3 feet or more of the ileum.
The average age of that group of patients was 38 years, the youngest being 19
and the oldest 57 years. The duration of symptoms varied from 6 months to
13 years, the average being 6 years. The symptoms were graded in an arbi-
trary manner on a basis of from 1 to 4. Those with a grading of 4 had severe
cramps, much diarrhea, great systemic depletion, marked loss of weight, pro-
found anemia, and reduction of serum protein; eight patients were of this type.
Seven were graded as 3, and 5 as 2. Practically all the patients had anemia, the
lowest hemoglobin being 8.4 Gm. per 100 cc. of blood with 2,750,000 erythro-
cytes per cubic millimeter of blood. In all cases the sedimentation rate was
elevated, ranging between 33 and 88 mm. the first hour (Westergren technic).
The serum protein was reduced in a good many, indicating the severity of the
depletion, the lowest recorded serum protein being 3.5 Gm. per 100 cc.

The roentgen-ray therapy consisted of irradiation of 4 areas covering the
whole anterior aspect of the abdomen. The x-rays were generated at 130 kv.
and filtered with 6 mm. of aluminum. The output was 135 r measured in air.
The treatment was repeated at intervals of one month until at least 3 courses
of treatment were given. Subsequent treatment was given as indicated on the
basis of symptoms. Three patients had 2 courses of treatment, 4 patients had
3 courses, 4 patients had 4 courses, 5 patients had 5 courses, one patient had
7 courses, one patient had 9 courses, and 2 patients had 15 courses.

In 10 cases the results of treatment were excellent, measured by the ab-
sence of abdominal discomfort, almost complete elimination of diarrhea and a
return to normal occupation. In 5 additional cases a good result was achieved,
measured on the basis of marked improvement but not complete diminution of
symptoms. However, in only one case was there striking roentgenologic evidence

of improvement. In the others there was little change as far as the roentgeno-
logic picture was concerned between the first and second years after treatment.
Subsequent surgical treatment was done because of obstructive features in 2 of
the patients and the surgeon was impressed with the amount of fibrosis which
had taken place. In these 2 patients there was some change for the better after
treatment but this was only temporary. Two patients died; one had very exten-
sive involvement of most of the small intestine; the other had extensive involve-
ment with enterogastric, entero-abdominal and enterovaginal fistulas, and was
obviously not a suitable subject for any form of treatment.

Those dealing with patients with regional ileitis have come to observe
2 types of disease; in the one type the ulcerative phase is the predominant one,
in the other there is much fibrosis, formation of granuloma, stricturing, and
tendency to formation of fistula. The latter type is inclined to remain more as
a local disease than the former type. In evaluating therapy it is important that
this differentiation be kept in mind. The results of therapy in the localized hyper-
plastic type of disease are better than in the ulcerative type whether treatment
be surgical, or medical in any form.

By the spring of 1949, 50 patients had been treated with roentgen rays.
The results have been somewhat similar to those reported for the first 20 pa-
tients. Again some patients had not been observed long enough to be included
in the report. However, in 1949 the results could be evaluated sufficiently to
say that in 20 of the 43 cases in which the period of observation was sufficiently
long, the results were very favorable in that the patients became largely
symptom-free and were able to return to their former occupations. Fourteen
others were improved, 7 were not helped, and 2 had died. Additional therapeutic
measures in these cases have included a high-protein diet, periodic courses of
sulfathalidine and other supportive measures.

The results from this study suggest definitely that although the active dis-
ease may be stayed, or at least interrupted, healing and subsequent cicatriza-
tion are likely to occur and this may or may not eventually lead to surgical treat-
ment. (Proc. Soc. Staff Meet., Mayo Clin., 4 Jan. '50, W. C. Popp et al.)

* * * * * *

Effect of Cortisone on Production of Granulation Tissue in the Rabbit:
Since Hench and his co-workers demonstrated the dramatic therapeutic effect
of cortisone and adrenocorticotropic hormone (ACTH) in rheumatoid arthritis,
numerous investigators have found that these agents exert beneficial effects in
other disorders. These include such mesenchymal diseases as rheumatic fever,
lupus erythematosus disseminatus, and periarteritis nodosa. The mechanism by
which therapeutic effects are achieved has not, up to the present, been clarified,

but it has appeared to the writers that the action of these agents is on host re-
activity. In the course of treatment of several patients with lupus erythemato-
sus disseminatus and rheumatoid arthritis with ACTH, it was noted that open
wounds, such as incised abscesses and decubitus ulcers, failed to show normal
granulation tissue. One such wound, an incised abscess, did not form granula-
tion tissue until 4 days after ACTH was discontinued. Healing of aseptic wounds,
made for biopsy, was greatly delayed while ACTH was administered, but these
healed promptly when the hormone was discontinued. These observations
raised the question of whether the action of ACTH and cortisone in the mesen-
chymal diseases might be a result of inhibition of reactivity of the connective
tissue. Patients with hyperadrenalism as manifested by Cushing's syndrome
are known to have a disturbance in connective tissues as exemplified by the
moon facies, formation of striae, osteoporosis, increased fragility of blood
vessels, and poor healing of wounds. To test this hypothesis it was decided to
determine whether the administration of cortisone might inhibit the normal
processes of granulation tissue formation in artificially produced wounds in
rabbits.

The development of granulation tissue in the animals given 12.5 mg. of
cortisone intramuscularly twice daily was markedly delayed in all cases.
Grossly, at both 5 and 8 days following operation, these rabbits showed little
or no granulation tissue and the blood vessels of the wound stood out clearly,
whereas the controls showed good granulation tissue which obscured the blood
vessels. Two pairs of rabbits were sacrificed on the fifth postoperative day
and 2 pairs were sacrificed on the eighth postoperative day. The remaining 2
pairs were not sacrificed but showed similar gross changes and are being used
for further long-term experiments. The cortisone-treated rabbits developed
such manifestations of hyperadrenalism as the disappearance of circulating
eosinophils, a moderate postprandial hyperglycemia and a great increase in
glycogen deposition in the liver. Serum protein partitions in the animals re-
ceiving cortisone were comparable to those in the control animals. There was
no evidence of wound infection in either the cortisone-treated or control rabbits.

Histologically, the cortisone-treated rabbits at both 5 and 8 days post-
operatively showed striking depression of new growth of all elements of the con-
nective tissue. The height of the granulation tissue formed was markedly de-
creased. Few, if any, new blood vessels could be seen. On the eighth post-
operative day, fibroblasts in compact arrangement were present in nests about
old blood vessels. In the control animals the new fibroblasts were present
throughout the wound and appeared to be much less compact. Fibrils appeared
between the fibroblasts and there was more ground substance as determined
roughly by metachromasia with toluidine blue stains and by the Hale stain.

This suppression of all new elements of the connective tissue is similar
to that seen in scurvy. Plasma ascorbic acid levels in the cortisone-treated
rabbits tended to be somewhat lower than the control rabbits but the levels did

not reach zero in the plasma. In this connection it is of interest that low ascorbic acid levels have been observed in the authors' clinic in 3 patients with Cushing's syndrome. In the production of scurvy by deficiency of vitamin C, complete disappearance of this vitamin from the plasma is found months before any interference with wound healing is noted. Thus, if this effect be related to vitamin C deficiency the result might be caused by impairment of utilization of available ascorbic acid. No manifestations of the hemorrhagic diathesis were observed in the animals receiving cortisone. This correlates well with clinical findings in human beings; no manifestations of scurvy have developed in patients whom the authors have treated with ACTH for as long as 4 months, and ascorbic acid when administered daily in amounts of from 600 to 900 mg. to patients being treated for rheumatoid arthritis with ACTH or cortisone has failed to change the beneficial effects. Further studies are in progress to titrate, if possible, the minimal dosage of cortisone necessary to inhibit the growth of granulation tissue in the rabbit. It is hoped that this might lead to a method for the assay of compounds active in the treatment of patients with mesenchymal diseases. (Proc. Soc. Exper. Biol. and Med., Dec. '49, C. Ragan et al.)

* * * * * *

Inhibition of the Urinary Excretion of 17-Ketosteroids by Caronamide:

The renal excretion of penicillin has been effectively inhibited by the concomitant administration of the drug, caronamide (4'-carboxyphenylmethanesulfonanilide). Caronamide does so by inhibiting the transport mechanism responsible for the tubular excretion of penicillin. It has been demonstrated that caronamide inhibits also the excretion of para-aminohippurate and phenolsulfonphthalein but has no effect on the glomerular filtration rate, the Tm of glucose or arginine, or the clearance of urea or sulfonamides. A study was made on the effect of this compound on the urinary excretion of 17-ketosteroids in man.

After a control period of from 2 to 3 days, during which 17-ketosteroid levels were determined (by the method of Fraser et al.), one female and 3 male patients received 24 Gm. of caronamide in divided doses per 24 hours. The female received the drug only 2 days; the males for longer periods. Each male had some degree of gastric distress toward the end of the drug period. Each subject had a sharp drop in the 17-ketosteroid level in the urine during the administration of drug, followed by a return to normal after a slight lag period. This seems to indicate that in sufficient dosage, caronamide will inhibit the excretion of endogenously manufactured 17-ketosteroids. The apparent absence of any rebound after the discontinuance and elimination of the drug might suggest increased degradation of these substances to non-17-ketosteroid derivatives when their natural avenue of excretion is blocked, or their alternate elimination by some other excretory route.

The injection of testosterone into a human being is accompanied by an immediate increased excretion of 17-ketosteroids. A eunuchoid male was given

a single injection of 80 mg. of crystalline testosterone in aqueous suspension after a 48-hour control period. This was followed by a sharp increase in 17-ketosteroid output. Five days later, after the patient's steroid excretion became stabilized again, he was given 24 Gm. of caronamide in divided doses per 24 hours for 7 days. On the fifth day of this period he was given another injection of testosterone. The excretion of 17-ketosteroid following the injection of testosterone while the patient was receiving caronamide was distinctly less than that following the previous injection when the subject was not receiving the drug. However, when caronamide was discontinued 48 hours following the second injection, there was an immediate increase in steroid excretion. This might suggest that the degradation products of administered testosterone are not further degraded rapidly when their natural pathway of excretion is blocked, and that renal tubular excretion may possibly represent their selective excretory route. It also seems logical to assume that 17-ketosteroid excretion involves a renal tubular mechanism very similar to that for para-aminohippurate, phenolsulfonphthalein and penicillin. Further data must be obtained to substantiate these theories. (Proc. Soc. Exper. Biol. and Med., Dec. '49, G. W. Bissell et al.)

* * * * * *

Aureomycin in the Treatment of Patients with Chancroid: Aureomycin was administered in 3 cases of chancroid. Because the sulfonamides are of proved worth in chancroid and less costly, this study was conducted on a small scale.

The diagnosis of chancroid was established in each case by the demonstration of Hemophilus ducreyi on cultures made from swabs taken from the lesions and by the presence of a positive skin test with the Ducrey antigen. At the time of this study, the limitations in the supply of drug permitted the usage of a maximum daily dosage of 2 Gm. of aureomycin.

Aureomycin given over a period of from 7 to 14 days was effective in the treatment of these 3 patients. It is not possible in this small series to compare the rate of healing with that obtained with the sulfonamides nor is it known what the effect of larger daily doses of aureomycin might have been. No toxic symptoms appeared although one individual complained of nausea. He was able to continue the drug, however.

Since the undertaking of this work, evidence has been presented showing that aureomycin has both an in vitro and in vivo effect on Treponema pallidum. In 7 of 15 cases of early syphilis, a daily dose of 2 or 4 Gm. of aureomycin caused the disappearance of motile T. pallida from lesions in 48 hours. It appears, therefore, that the use of aureomycin in chancroid might lead to the masking of a concurrently acquired syphilitic infection. For this reason, aureomycin is recommended only for use in specific instances in which the sulfonamides are not tolerated. Under such circumstances, careful clinical and

serologic examinations should be made for from 3 to 6 months to exclude the possibility of missing otherwise the diagnosis of a simultaneously acquired syphilis. (Am. J. Syph., Gonor. and Ven. Dis., Jan. '50, H. E. C. Zheutlin and R. C. V. Robinson)

* *. * * * *

Study of Criteria of Cure in Gonorrhea: Jacoby and Rosenthal, working in the New York City Department of Health Clinics, undertook a study to determine upon the desirability of revising downward the following which have been in use as criteria of cure.

For Males. Disappearance of clinical signs and symptoms followed by 3 negative urethral and prostatic smears and cultures taken at weekly intervals.

For Females. Disappearance of signs and symptoms followed by 3 negative urethral and cervical smears and cultures taken at weekly intervals.

A total of 1,131 patients with gonorrhea admitted during a single month (October 1948) and treated by a single intramuscular injection of 300,000 units of penicillin in oil and beeswax was surveyed. There were 885 males and 246 females in this group. Of the males, 234, and of the females, 32 failed to return for any post-treatment examination. The remaining 651 males and 214 females had at least one post-treatment smear and culture. Of those returning for a second post-treatment smear and culture 401 were males and 158 were females. Two hundred fifty-nine males and 105 females returned for a third smear and culture.

Of the 214 women who returned for post-treatment observation, positive smears or cultures were found among 30, a total failure rate of 14 percent. Eighteen positive smears and cultures were found on the first examination, a failure rate of 8.4 percent; of the 158 reporting for a second smear and culture, 6 were positive; and of the 105 reporting for a third smear and culture, an additional 6 were positive, making an additional failure rate on second and third culture of 5.6 percent.

Of the 651 men who returned for post-treatment observation, 78 were found positive on smear and culture, a failure rate of 12 percent. Forty positive smears or cultures were found on the first examination, a failure rate of 6.1 percent. Of the 401 patients having a second smear and culture, 24 were positive; and of the 259 reporting for a third smear and culture, 14 were positive, making an additional failure rate of 5.9 percent. Further study of these 38 positive smears and cultures on second and third examination shows that 14 were positive at examinations made later than 21 days after treatment, and of the remaining 24, 10 were positive on smear examinations only. It was

believed justifiable to consider that these 24 patients (14 positive after 21 days, and 10 with positive smears) had, in all probability, reinfections rather than treatment failures. In any case, these patients with presumable reinfections might have returned voluntarily for re-treatment because of reappearance of symptoms. Eliminating these 24 patients with positive smears reduces the 5.9 percent of additional failures on second and third examination to 2.2 percent.

In the females, even assuming that all positive results obtained on second and third examinations were failures, a maximum of 5.6 percent would have been detected in addition to the failures found on the first examination.

With only from one third to one half of patients returning at weekly intervals for 3 cultures and a possible failure to detect an additional 2.2 percent to 5.6 percent of patients not responding to therapy by elimination of the second and third examination, it appears that the loss by omitting such second and third examinations can reasonably be assumed without serious detriment. The authors consider, furthermore, that the time and personnel required in case holding of this type can be utilized more profitably in other phases of the venereal disease control program. They therefore propose to limit examinations for the determination of cure to a single post-treatment smear and culture made within 7 days after treatment is administered, and to discharge patients who are negative on these examinations. (Am. J. Syph., Gonor. and Ven. Dis., Jan. '50)

* * * * * *

Neurosurgical Approach for Fenestration Operation: M. Bordes-Valls, a neurosurgeon of Valencia, Spain, has devised an approach not only for the fenestration operation but also for all procedures in which access to the middle ear and labyrinth is required. Scophedal (a preparation containing 0.5 mg. of scopolamine hydrobromide, 10 mg. of dihydrohydroxycodeinone hydrochloride, and 25 mg. of racephedrine hydrochloride per cubic centimeter), 0.5 cc., is given intramuscularly a half hour before the operation and the patient's temporo-parietal region shaved and cleaned. Procaine and epinephrine hydrochloride are used for local anesthesia. An incision is made through the skin and temporal muscle to the bone. The incision is perpendicular to the zygomatic arch and extends from the upper part of the helix upward for about 8 cm. The temporal muscle is elevated and the bone bared. A craniotomy as close as possible to the floor of the middle fossa is performed with a gouge of about 3 or 4 cm. The dura is elevated until the arcuate eminence becomes clearly visible; this is about 3 cm. from the cranial wall. The tegmen tympani now becomes visible just lateral to the eminence. The porosity of the bony tegmen is characteristic at this point. With the use of an electrically driven burr the tegmen is thinned down and perforated. This perforation is then enlarged with a curet until the head of the malleus and the lateral semicircular canal become visible. The

final hole should be about from 10 to 15 mm. in diameter. At this point, a system of continuous irrigation and suction is instituted and maintained until the conclusion of the operation. The head of the malleus is disarticulated from the incus. This can be done with great ease through this approach. Sometimes it may not even be necessary to remove the incus; however, to prevent ossicular stiffening, it is recommended that the incus be removed. From now on the creation of the fenestra with use of an electrical burr follows the technic developed by Lempert; the window is made in the anterior portion of the lateral semicircular canal.

When the fenestration is completed, a piece of temporal bone is placed over the perforation in the tegmen tympani in order to prevent herniation of the dura into the middle ear. The fenestra nov-ovalis lies about 4 mm. from the floor of the middle cranial fossa. The muscle is then sutured, and the fascia and skin are closed.

The advantages of this neurosurgical approach should be considered. The anesthesia is extremely simple, consisting almost purely of local infiltration, and there is no discomfort to the patient during the operation. There is a tremendous reduction in the time required for the entire procedure, because very little boring has to be done. This procedure is similar to the decompression of Cushing and the procedure for trigeminal section of Frazier, and consequently it is well known to all neurosurgeons. Another advantage of this new procedure is the obviation of any involvement of the facial nerve, because the lateral canal protects the nerve completely. Furthermore, the incision is closed primarily and the integrity of the middle ear retained. In addition, another advantage over Lempert's technic is that the operation can be done when there are adhesions in the middle ear or distortions of the drum membrane. There is also no need to wait for epithelization, and there is no bothersome drainage postoperatively. There is the cosmetic advantage that the scar disappears when the hair grows back. The time of the operation is considerably reduced. The author plans to report his results when a sufficient length of time has elapsed following a series of cases.

In his first case the author did not leave a flap over the fenestra, which was left exposed in the middle ear. He believes, however, that with his technic the chances of infection are almost nil, and there is no fear of labyrinthitis. The author considers that his procedure has no reason to produce worse results than the procedure utilizing the skin flap. (Arch. Otolaryng., Jan. '50)

* * * * * *

Motor Vehicle Accidents and USN Personnel: Motor vehicle accidents, which constitute a formidable public health problem generally, are also found to constitute a substantial problem among naval (including Marine Corps) personnel.   The records reveal that more than 75 percent of all motor vehicle accidents in which personnel of the Navy are involved occur while the individuals are in a leave or liberty status.

Data for motor vehicle accidents have been obtained from the Individual Statistical Report of Patient (NAVMED-Fa), covering the war years 1942-45, and for the subsequent years of 1946, 1947, and 1948.   These data which include the type of motor vehicle involved with the cause and nature of the violence or accident lend themselves in an evaluation of the extent of the loss to the Navy.

It should be borne in mind that the war years covered a period during which motor vehicle travel was considerably curtailed because of gasoline rationing and other restrictions, and that yearly since then there has been a steady increase in the availability of motor vehicles. The accidents reported include collisions and overturning, run over and struck by, and all other causes. Included among accidents in the group "all other causes" are breaking of a car or part not resulting in collision or overturning, cranking, driving off dock or pier, driving off embankment or cliff, falls from, thrown from, jumping from or stepping from vehicle, repairing or overhauling, and other miscellaneous causes. This group, therefore includes some accidents other than traffic accidents.

During the 3 postwar years 1946 through 1948, a total of 17,610 persons in the Navy were admitted to the sick list as a result of motor vehicle accidents. The case incidence for all injuries in the Navy during the period under discussion shows a steady decline, but the percent associated with motor vehicles increased slightly each year. The incidence rate per 1,000 strength for all injuries showed a dip in 1946 to 40.3, followed by a rise in 1947 and 1948 to the 1942-45 level. The incidence rate for motor vehicle injuries, however, has shown a steady rise, going from 4.8 per 1,000 strength during the 1942-45 period to 6.3 in 1946, 8.4 in 1947, and 8.5 per 1,000 strength in 1948.

The number of deaths resulting from injuries, which constitutes the greater proportion of the total deaths among naval personnel, has been declining recently. Of deaths from injuries, the percentage caused by motor vehicle accidents was 11.4 during 1942-45, it increased to 32.2 percent in 1946 and from that figure went up slightly in 1947 and 1948. Deaths incident to motor vehicle accidents now account for one out of every 3 deaths following injury.

In table I is shown the average number of sick days per new case for motor vehicle accidents, and the sick days associated with accidents resulting from the various types of motor vehicles. There was a reduction in the number

TABLE I
MOTOR VEHICLE ACCIDENTS, NAVY AND MARINE CORPS
1942-1945, 1946, 1947, and 1948

CAUSE AND NATURE OF VIOLENCE	1942-1945				1946				1947				1948			
	New admissions	Total sick days	Average days per case	Number of deaths	New admissions	Total sick days	Average days per case	Number of deaths	New admissions	Total sick days	Average days per case	Number of deaths	New admissions	Total sick days	Average days per case	Number of deaths
Total	47,873	1,892,930	39.5	2,604	8,317	545,828	65.6	600	4,952	241,928	48.8	294	4,341	197,073	45.4	278
Motorcycles	2,790	152,123	54.5	131	788	59,788	75.9	49	642	34,909	54.4	34	658	40,336	61.3	35
Collision and overturning	1,173	68,662	58.5	74	286	28,309	99.0	25	232	14,708	63.4	15	292	23,353	80.0	18
Run over and struck by	101	6,325	62.6	1	5	1,229	245.8	-	7	578	82.6	-	11	333	30.3	1
All other causes	1,516	77,136	50.9	56	497	30,250	60.9	24	403	19,623	48.7	19	355	16,650	46.9	16
Passenger automobiles	23,257	986,048	42.4	1,521	4,574	307,874	67.3	368	2,957	143,530	48.5	205	2,835	122,505	43.2	202
Collision and overturning	9,696	331,912	34.2	739	1,678	89,793	53.5	197	1,111	47,770	43.0	88	1,075	44,215	41.1	82
Run over and struck by	4,350	252,942	58.1	330	544	66,296	121.9	56	263	19,117	72.7	25	193	13,953	72.3	15
All other causes	9,211	401,194	43.6	452	2,352	151,785	64.5	115	1,583	76,643	48.4	92	1,567	64,337	41.1	105
Auto trucks	13,497	459,829	34.1	624	1,131	76,772	67.9	55	667	29,439	44.1	28	356	13,237	37.2	16
Collision and overturning	2,790	108,338	38.8	355	323	24,416	75.6	30	167	8,038	48.1	12	64	2,513	39.3	9
Run over and struck by	1,742	77,341	44.4	104	187	14,001	74.9	8	65	5,121	78.8	6	47	2,216	47.1	5
All other causes	8,965	274,150	30.6	165	621	38,355	61.8	17	435	16,280	37.4	10	245	8,508	34.7	2
All other vehicles	8,329	294,930	35.4	328	1,824	101,394	55.6	128	686	34,050	49.6	27	492	20,995	42.7	25

TABLE II

MOTOR VEHICLE ACCIDENTS WHILE ON LEAVE OR LIBERTY

NAVY AND MARINE CORPS, 1942-45, 1946, 1947, and 1948

CAUSE AND NATURE OF VIOLENCE	1942-45				1946				1947				1948			
	New admissions	Percent of total accidents	Deaths Number	Deaths Rate per 1,000	New admissions	Percent of total accidents	Deaths Number	Deaths Rate per 1,000	New admissions	Percent of total accidents	Deaths Number	Deaths Rate per 1,000	New admissions	Percent of total accidents	Deaths Number	Deaths Rate per 1,000
Total	26,322	55.0	1,758	0.18	5,745	69.1	445	0.34	3,798	76.7	260	0.44	3,561	82.0	254	0.50
Motorcycles	2,068	74.1	110	0.01	676	85.8	42	0.03	598	93.1	34	0.06	620	94.2	34	0.07
Collision and overturning	913	77.8	60	0.01	248	86.7	23	0.02	218	94.0	15	0.02	279	95.5	18	0.04
Run over and struck by	74	73.3	1	0.00	4	80.0	-	0	6	85.7	-	0	7	63.6	-	0
All other causes	1,081	71.3	49	0.00	424	85.3	19	0.01	374	92.8	19	0.03	334	94.1	16	0.03
Passenger automobiles	19,212	82.6	1,338	0.13	4,095	89.5	331	0.25	2,700	91.3	191	0.32	2,629	92.7	195	0.38
Collision and overturning	8,098	83.5	630	0.06	1,511	90.0	177	0.13	1,022	92.0	81	0.14	1,028	95.6	82	0.16
Run over and struck by	3,711	85.3	308	0.03	483	88.8	51	0.04	243	92.4	25	0.04	167	86.5	15	0.03
All other causes	7,403	80.4	400	0.04	2,101	89.3	103	0.08	1,435	90.6	85	0.14	1,434	91.5	98	0.19
Auto trucks	2,491	18.4	168	0.02	302	26.7	17	0.01	193	28.9	15	0.02	70	19.7	8	0.02
Collision and overturning	761	27.3	68	0.01	135	41.8	14	0.01	86	51.5	8	0.01	12	18.8	2	0.00
Run over and struck by	481	27.6	50	0.01	52	27.8	1	0.00	26	40.0	4	0.01	19	40.4	4	0.01
All other causes	1,249	13.9	50	0.01	115	18.5	2	0.00	81	18.6	3	0.01	39	15.9	2	0.00
All other vehicles	2,551	30.6	142	0.01	672	36.8	55	0.04	307	44.8	20	0.03	242	49.2	17	0.03

of days on the sick list for accidents from each type of motor vehicle between 1946 and 1948 except those caused by motor cycles, which increased from 54.4 days per case in 1947 to 61.3 days in 1948.

A marked increase is noted in the proportion of motor vehicle accidents among Navy personnel while on leave or liberty, as shown in table II. In 1948, of all motor vehicle accidents, 8 out of 10 occurred while the individual was on leave or liberty, an increase of approximately 30 percent over the period 1942-45. Motorcycles and passenger automobiles during the postwar years continue to be the leading causes of motor vehicle accidents, with more than 75 percent of the total occurring while on leave or liberty during 1947 and 1948. Motor trucks were the only type of vehicle which showed a decline in the percentage occurring while on leave or liberty, accounting for 19.7 percent of the total accidents associated with trucks in 1948 as compared to 28.9 percent in 1947. It is very probable that the curtailment in both personnel and motor driven vehicles in the Service during the past several years have had their effect on the decreasing proportion of motor vehicle accidents while in command.

For the year 1948 a distribution was made of all motor vehicle accidents according to age groups. As may be noted in the table below, the highest admission rates are for the age group of from 20 to 24, closely followed by the age group of from 25 to 29.

MOTOR VEHICLE ACCIDENTS, BY AGE GROUPS, NAVY AND MARINE CORPS - 1948

AGE GROUP	STRENGTH IN GROUP	INCIDENCE		DEATHS	
		Number	Rate per 1,000	Number	Rate per 1,000
All Ages	508,081	5,407	10.6	278	0.5
Under 20	156,756	1,164	7.4	59	0.4
20 - 24	182,717	2,790	15.3	153	0.8
25 - 29	83,582	910	10.9	45	0.5
30 - 34	44,713	313	7.0	14	0.3
35 - 39	23,309	136	5.8	1	0.0
40 - 44	10,111	61	6.0	4	0.4
45 - 49	4,637	21	4.5	1	0.2
50 - 54	1,608	10	6.2	1	0.6
55 - 59	522	2	3.8	-	0
60 and over	126	-	0	-	0

(Statistics of Navy Medicine, Feb. '50)

*   *   *   *   *   *

Immunological Aspects of BCG Vaccination Against Tuberculosis: There
have been endless controversies concerning the dangers and effectiveness of
immunization with the BCG vaccine. Surprisingly enough, however, little has
been said or written concerning the immunological basis and the technical prob-
lems involved in the preparation of the vaccine or the measurement of its pro-
tective efficacy. Opponents as well as proponents of BCG vaccination seem to
accept implicitly that the technical procedures advocated by Calmette and his
associates for growing the micro-organism, preparing suspensions of it, and
assaying the development of immunity, are fundamentally adequate and need
not be modified except in detail. This is a questionable assumption and there
is much reason to suspect that many of the controversies elicited by BCG vac-
cination cannot be settled until a number of bacteriological and immunological
problems have been solved. Indeed, it is not unlikely that many of the failures
of vaccination can be traced to the utilization of defective vaccines and to the
lack of technics for differentiating between allergy and protective immunity.

The BCG vaccine is a suspension of living Mycobacterium tuberculosis
obtained from cultures of a strain so attentuated as to be incapable of causing
progressive disease in experimental animals. It is almost certain that the im-
munity produced by the vaccine is the outcome of a limited but definite multi-
plication of the attentuated bacilli in the body of the animal undergoing immuni-
zation, chiefly in the regional lymph nodes. The degree of immunization proba-
bly reflects in a certain measure the extent of this multiplication. It is very
likely, on the other hand, that the degree of multiplication depends in turn upon
at least 4 independent factors: (a) the number of living micro-organisms in-
jected, (b) their physiological state, (c) their level of attentuation (or virulence),
(d) the susceptibility of the immunized individual. As far as can be judged
from published experimental data and from present practice, these factors
are not yet sufficiently understood to permit critical and quantitative assess-
ment of the properties of the vaccine.

It is generally recognized that the numbers of viable bacilli in the BCG
vaccines prepared by standard methods and kept in fluid medium decrease
rapidly, even at icebox temperatures; considerable mortality of the bacilli
also occurs at the time of desiccation when attempts are made to preserve
the bacilli in the dried state. Although no reports of adequate quantitative
bacterial counts have been published, it is certain that the number of viable
organisms injected as an immunizing dose under the conditions of present-day
practice varies many thousandfold, depending upon the origin of the vaccine,
the time elapsed since its preparation, and the conditions under which it has
been preserved. As measured by direct microscopic count or by dry weight
of bacillary bodies, the vaccines currently distributed in this country and
abroad contain from 1 to 5 billion bacterial cells per cc. of fluid. Viability
tests reveal, however, that only a fraction of a percent of these cells, at times

less than 0.001 percent, are viable at the time of injection. In view of this fact, the general practice of giving directions in terms of cc. or mg. of vaccine is entirely meaningless and perhaps dangerously misleading because it tells nothing of the number of living bacilli per volume or unit weight.

The ability of all bacterial agents to multiply in the animal body depends not only upon the size of the viable infective dose but also upon the physiological state of the bacterial cells at the time of injection. The conventional technics used in the cultivation and distribution of the BCG vaccine expose the bacilli to such a variety of chemical and physical trauma that any vaccine preparation consists of an unpredictable mixture of cells possessing all degrees of physiological age and activity. It is therefore imperative that technics be worked out to obtain bacterial populations of a reasonable degree of homogeneity in order to control their ability to multiply in vivo.

In addition to its physiological state, the intrinsic virulence of a culture is a determining factor of the extent to which it multiplies in susceptible animals. At least 3 general levels of intrinsic virulence have been recognized among mammalian varieties of M. tuberculosis. They are represented by: (a) the classical virulent strains capable of causing progressive disease, (b) the truly avirulent variants (illustrated by the various Ra cultures isolated at the Trudeau laboratory) which appear completely incapable of multiplying in vivo, and (c) the attentuated strains which multiply to a certain extent in vivo but fail to cause progressive disease under normal conditions (such as the BCG strains and the culture RIRV isolated at the Trudeau laboratory).

As far as is known, all the strains of BCG presently in use are derived from the attentuated culture first obtained by Calmette and Guerin. Although there is as yet no incontroverted evidence that this culture has ever recovered full virulence, there is no doubt that it has undergone considerable variations in the course of its long career. And indeed, it would be very surprising if it had not. Jensen, for example, has pointed out that the strains available in Scandinavia at the end of World War II varied appreciably with reference to the severity of the skin lesions which they could elicit in normal guinea pigs. Similarly, it has been observed in the laboratory of the author and co-workers that 3 strains of BCG obtained from American collections differ significantly in their ability to produce pulmonary lesions in mice following intravenous injection. Here again, studies of the comparative virulence (or attenuation) of different strains will have quantitative meaning only when the inoculation dose is defined in terms more significant than the designation of the volume or weight of culture used.

It must be remembered also that any statement concerning the virulence of a culture should be qualified by specifying not only the species and the strain, but also the physiological state of the animal used for the test. Thus, it has been

shown at the Saranac laboratory that the strain RIRV (in many respects diffi-
cult to differentiate from BCG) causes severe disease in the silicotic guinea
pig but not in normal animals. It has also been found in the laboratory of the
author and co-workers that one of the BCG strains commonly used for immuni-
zation can cause severe pulmonary disease, and sometimes death, when injected
in sufficient amounts into mice maintained on deficient diets. Presumably in
most studies the physiologic state of the animals has not been altered in such
a fashion. It is possible, however, that some of the conflicting reports con-
cerning the virulence of BCG for guinea pigs might reflect the presence of dif-
ferences in the physiologic state of the animals used by the various investiga-
tors.

Most tests aimed at evaluating the immunizing efficacy of BCG have been
carried out by injecting into guinea pigs or cattle amounts of vaccine far greater
than those used in human vaccination. In some cases the amounts were so great
(of the order of 10 mg. of bacillary bodies per Kg. of body weight) that a definite
degree of immunity could have been achieved with the same weight of bacilli
killed by heat. Needless to say, immunization tests carried out under such
conditions do not reflect the immunizing efficacy of the vaccine as used for
immunization of human beings.

Of extreme importance also is the technic employed in the challenge in-
fection used to assay the resistance of the immunized animal. When suspen-
sions of M. tuberculosis are injected intramuscularly or subcutaneously into
immunized guinea pigs, they elicit the complex allergic reaction familiarly
known as the Koch phenomenon. One of the results of the Koch phenomenon
is that a large percentage of the bacilli are ejected from the tissues as soon
as the lesion elicited by the allergic reaction begins to ulcerate. As this re-
action does not take place in normal animals, it follows that the immunized
guinea pig is subjected in fact to an infective dose of bacilli smaller than that
which invades the tissues of the nonimmunized controls. For lack of quantita-
tive information, it is not possible to evaluate the effect of this discharge or
walling off of bacilli at the site of the ulcer on the greater resistance to artifi-
cial infection exhibited by vaccinated guinea pigs. It appears certain, however,
that the importance of this effect is not small, as any decrease in the size of
the infective dose markedly increases the survival time of the animals. Thus,
in certain cases, the apparent immunity of guinea pigs following BCG vaccina-
tion might be nothing but an immunological artifact resulting from the loss of
a significant fraction of the inoculum.

It is possible that the shedding or walling off by the vaccinated guinea
pigs of some of the bacilli injected intramuscularly or subcutaneously has its
counterpart in infection in human beings. But even then, it is probable that many
of the bacilli are distributed throughout the human tissues instead of being dis-
charged outside the body. Thus, the Koch phenomenon, which probably results

in some protection of the vaccinated guinea pigs against artificial infection, may fail to have a corresponding protective effect under the usual conditions of the disease in human beings. Fortunately, there are many facts which suggest the existence of an antituberculous immunity completely independent in its mechanism from tuberculin allergy. Much additional work is therefore required toward the formulation of technics for evaluating the effectiveness of BCG as an immunizing agent under conditions that would reflect the processes at work in the human body.

In the final analysis the usefulness of BCG immunization must be measured by its ability to protect human beings and cattle against tuberculous infection. Field trials in cattle have been so unconvincing that the technic has never achieved widespread application in veterinary medicine. There are, however, a few studies on record which appear to prove that, in selected situations and when the immunization tests are carried out with sufficient care, it is possible to achieve with BCG vaccination a significant degree of immunity in human populations. There are also, on the other hand, many records of failure. It has been argued that these failures were the result of faulty immunization procedures but there is no way to prove or disprove this contention because there is no method, short of infection, to measure protective immunity.

The development of a positive tuberculin test is universally used as a criterion that the vaccine has "taken" but, unfortunately, as already pointed out, the relationship of tuberculin allergy to immunity is one of the most obscure aspects of the pathogenesis of tuberculosis. It is possible to render animals tuberculin positive by injecting dead bacilli into them without increasing thereby their resistance to infection. It is well possible that under certain conditions injection of BCG may also bring about a state of allergy without inducing immunity. So important is the necessity to differentiate between allergy and immunity that it may be useful to illustrate the difference by examples taken from 2 other bacterial infections. The use by Pasteur of living attenuated cultures for immunization against anthrax (the first forerunner of BCG immunization) resulted in spectacular protection of animals provided the challenge infective dose was given within a fairly short period of time after vaccination. Pasteur himself, however, soon recognized that the immunity was only transient and ne advised that the vaccination be repeated every year, preferably just before the beginning of the anthrax season. Nevertheless, it is now known that long after vaccination has lost its protective effect against infection there are still present in the vaccinated animals antibodies, some of which are capable of giving rise to allergic reactions, which bear no relation whatever to immunity. The presence and quantitative measurement of these anthrax antibodies would give no information concerning the resistance of the animal to anthrax infection.

The extensive knowledge of the immunochemical reactions involved in streptococcal diseases also affords a striking example of dissociation between

immunity and allergy. Infections caused by human streptococci of group A bring about a state of tuberculin-like allergy to the streptococcal nucleoprotein fraction. It has been demonstrated beyond doubt that, far from resulting in any increased resistance to streptococcus disease, this allergy may be the cause of severe pathologic lesions. On the other hand, a highly effective and type-specific resistance to infection is elicited by an antibody specifically directed against an entirely different streptococcal protein, the so-called M substance. It has been thoroughly established that the state of allergy to the nucleoprotein and the immune resistance produced by the M antibody are completely independent of each other. Following natural infection or immunization, both allergy and resistance may coexist or only one may be present, depending upon certain immunological conditions.

It must not be forgotten, moreover, that the response of an individual to an immunizing procedure is greatly affected by his physiological state. It is even conceivable that many of the classes of human beings who are most dangerously exposed to tuberculosis, for example, those living under conditions of great economic stress, with inadequate food supplies, may be those least capable of responding satisfactorily to immunization procedures. For all these reasons, it is urgent that technics be developed for the measurement of true immunity (not tuberculin allergy) in order that the BCG immunization programs can be intelligently controlled.

Unfortunately, little is known of the immunological mechanisms, humoral or cellular, which bring about immunity to tuberculosis. It is not yet possible, therefore, to devise any laboratory test that would control the effectiveness of BCG vaccination. Nevertheless, BCG is the only immunizing agent for which there is enough experience to warrant administration to human beings, and the urgency of the practical problems of tuberculosis may compel its use even though so much of its immunological properties is ignored.

The advisability of undertaking a BCG immunization program in any given community has to be decided on the basis of many clinical, epidemiological, and social factors which do not come within the province of the present discussion. BCG immunization, like any other public health measure, must satisfy a number of minimal requirements of dependability, predictability, and evaluation of efficacy. It is because these requirements were ignored that most of the vaccines and sera introduced into medical practice in the past have not been completely discredited. It is to be feared that the same fate will happen to BCG, unless steps are taken soon to learn to control the factors which determine the efficacy of immunological procedures, namely, the effective size of the immunizing dose, the antigenic potency of the vaccine, and the response of the immunized individual in terms of protective immunity. The analysis of these factors and the development of technics by which they can be quantitatively evaluated come within the range of the classical approach to bacteriological and immunological problems and it seems that they are the responsibility of those who advocate the widespread use of BCG as an immunizing agent. (Am. Rev. Tuberc., Nov. '49, Editorial by R. J. Dubos)

Use of Ozone in Laundry Operations: In response to an inquiry concerning the use of ozone in the laundries of certain U. S. Government hospitals, the National Research Council recently submitted the following statement of opinion:

"1. Reports of adequate tests by disinterested and competent authorities are not available to show that the use of ozone in laundry operations is of established value.

2. Ozone is a highly irritating gas which, authorities agree, should not be tolerated in a working atmosphere in concentrations above one part per million. For this reason this Subcommittee does not recommend the use of ozone in a laundering operation without extensive evidence that:

   (a) The process has been proved by adequate tests to be of sufficient value in the laundering process to justify the addition of adequate controls against excessive exposure of operators.

   (b) A system of proved value has been worked out to insure the necessary control of the rate of generation of ozone and its continuous removal to prevent atmospheric contamination. No record of any such system is available.

3. Until adequate evidence as called for in (a) and (b) of paragraph 2 above is available, we believe that the hazards associated with the use of ozone are too great to warrant its use for this purpose."

*   *   *   *   *   *

Rheumatic Fever in USN During World War II: Rheumatic fever was one of the more important medical problems among the infectious diseases during the war period. It was important not only because of the disability occasioned during its acute phase, but even more because of the permanent disability from valvular heart disease which not infrequently follows.

During the period 1942 through 1945, there were 21,211 cases of rheumatic fever reported in the Navy (includes Marine Corps). In addition to these cases there were also 3,446 readmissions for this condition, a ratio of one readmission for each 6 new cases. Rheumatic fever was fifth among the leading causes of man power loss, because of time spent on the sick list and fourteenth among the causes for invaliding from the Service. This diagnosis accounted for a total of 3,144,314 sick days during this 4-year period, an average of almost 150 sick days per case. It was the cause of at least 5,442 invalidings during the period under discussion. Many more individuals were undoubtedly invalided for sequelae of the disease, and do not appear in these figures. During the 4 war years an average of 2 persons out of each 1,000 in the Navy and Marine Corps were

continuously on the sick list for this condition. Of the total cases, 83.3 percent occurred in the continental United States, and the rates for continental United States shore stations were higher than those for other areas. The Thirteenth Naval District had the highest incidence rate, with the Ninth Naval District ranking second. A large number of cases occurred at the training station at Farragut, Idaho, in the Thirteenth Naval District and at the training station at Great Lakes, Illinois, in the Ninth Naval District.

A definite seasonal trend is apparent in the monthly incidence rates for rheumatic fever; the peak incidence rates are much higher during the late winter and early spring months. There was a decrease in the seasonal peak incidence rates during the last 2 years of the war period. A majority of the cases, 54.8 percent occurred in personnel under 21 years of age. The average annual rate for the 4 war years for males was over twice that for females, 2.2 per 1,000 strength as compared with 1.0 for female personnel. The average annual incidence rate for Caucasian personnel (including races other than Negroid) was 2.2 per 1,000; the rate for Negroid personnel was 1.3 per 1,000. (Statistics of Navy Medicine, Feb. '50)

*   *   *   *   *   *

Communicable Disease Summary for Week Ended 28 January 1950: In the United States increases for the current week are noted in reported cases of diphtheria (from 149 to 199), influenza (from 4,563 to 6,512), measles (from 4,329 to 4,580), scarlet fever (from 1,649 to 1,860), typhoid and paratyphoid fever (from 43 to 50), and whooping cough (from 2,192 to 2,888).

The increase in reported incidence of influenza was almost entirely confined to Georgia (from 314 to 1,400) and Virginia (from 558 to 1,173). Kentucky increased from zero to 18, Tennessee from 26 to 117, and Alabama from 98 to 287. California reported 39 cases of influenza as compared with 8 for the preceding week. Hawaii reported 133 cases of influenza for the current week. For the Nation, the 5-year (1945-49) median is 4,534 for the corresponding week. The cumulative total for reported incidence of influenza this year is 19,477 as compared with 17,341 for the corresponding 5-year (1945-49) median. However, on the basis of seasonal years, the current cumulative total of 50,007 cases is lower than the corresponding median of 53,611 for the 5 (from 1944-45 to 1948-49) years.

Reported cases of whooping cough increased from 2,192 to 2,888 for the current week. The largest increases occurred in Georgia (from 4 to 216), Vermont (from 27 to 92), and New York (from 241 to 300).

Reported cases of measles increased from 4,329 to 4,580 for the current week. States reporting the largest increases were Michigan (from 910 to 1,060) and California (from 118 to 266).

Other increases were: scarlet fever (from 1,649 to 1,860), typhoid and paratyphoid fever (from 43 to 50), and rabies in animals (from 135 to 142).

New Mexico reported one case of confirmed bubonic plague (glandular) in Maljamar, Lea County. One case of smallpox and an increase from 7 to 48 cases of scarlet fever were reported in Arizona. One case of anthrax was reported in New York.

For the Nation, meningococcal meningitis decreased from 106 to 79, pneumonia from 2,274 to 2,104, poliomyelitis from 117 to 114, and tularemia from 32 to 25. (Issued by National Office of Vital Statistics, U. S. Public Health Service, Federal Security Agency, Based upon preliminary reports by telegraph from State health offic~s.)

* * * * * *

USN Graduate Medical Training Program: A review of the Navy's Graduate Medical Training Program as of 1 January 1950 discloses that among the 1,570 medical officers of the regular Navy on duty as of that date, 208 hold certification by American Specialty Boards and in addition 30 have completed a portion of their board examinations. During the year 1949, 50 naval medical officers were certified and 27 have successfully passed Part I of the American Boards. This is the largest number certified in any one year since the inception of the program in 1920.

The specialties in which certifications have been made are: anesthesia 6; dermatology and syphilology 7; internal medicine 37; obstetrics and gynecology 15; ophthalmology 16; otolaryngology 25; orthopedics 16; pathology 13; pediatrics 8; plastic surgery 1; psychiatry and neurology 28; radiology 21; surgery 21; urology 11; and preventive medicine and public health 13.

The trend toward specialization in recent years prompted the Bureau of Medicine and Surgery to institute a revised program of such training in 1946 whereby naval medical officers could advance professionally and also gain recognition in their specialty. The goal of the Bureau of Medicine and Surgery is to further the development of its doctors so that the professional standards of the Medical Corps of the Navy will be maintained on the highest levels.

Certification of naval medical officers is made possible through the combined resources of the Navy and many of the large civilian medical schools, medical centers and approved hospitals in every part of the United States.

At present there are 265 medical officers in approved residency train-
ing in our naval hospitals and 142 in approved residency training in medical
specialties in civilian hospitals throughout the United States and Europe. In
addition, 41 medical officers are undergoing training as follows: aviation
medicine 26; submarine medicine 4; hospital administration 2; radiological
defense 4; research (radiobiological) 1; biophysics (radiological) 1; and courses
in the colleges of the Armed Services 3.

A recent arrangement between the Surgeons General of the Army and the
Navy now makes it possible for a medical officer being assigned to the other
Service's hospital conducting residency training to be placed in training and
still be credited as one of the joint staff in accord with the policy on joint staffing.
Under this arrangement the Navy is now providing training to Army personnel
at Portsmouth, Virginia, and Long Beach, California. The residency training
facilities of naval hospitals are available also to medical officers of the Air
Force. The Army has offered residency training billets to naval personnel at
the Tripler General Hospital or in other Army installations in which joint staff-
ing may be developed. (Professional Div., BuMed)

*   *   *   *   *   *

Openings for Psychologists in Medical Department: The following civil-
service positions are open to psychologists for placement in naval hospitals of
the Medical Department of the Navy. For full particulars contact commanding
officers of respective naval hospitals or the Bureau of Medicine and Surgery,
Attn: Professional Division, Navy Department, Washington 25, D. C.

Clinical Psychologist for Neuropsychiatric Service, U. S. Naval Hospital,
Portsmouth, Virginia (Civil Service, GS-11, $5,400 per annum). Naval exper-
ience and personal analysis desired but not required. Consultative and diag-
nostic duties predominate, with little research and no training. Experience
and education: Doctoral level with experience in medical setting required.

Chief Clinical Psychologist for Neuropsychiatric Treatment, Training
and Research Center, U. S. Naval Hospital, Mare Island, Vallejo, California
(Civil Service, GS-13, $7,600 per annum). Naval experience and personal
analysis desired but not required. Education and experience: Ph.D., adminis-
trative, research, and training experience.

Clinical Psychologist (research) for Neuropsychiatric Treatment, Train-
ing and Research Center, U. S. Naval Hospital, Mare Island (same above) (Civil
Service, GS-12, $6,400 per annum). Naval experience and personal analysis
desired but not required. Education and experience: Ph.D., experience heavy
in experimental; must also be capable of conducting research in dynamic psy-
chology. (Professional Div., BuMed)

*   *   *   *   *   *

Joint Letter

Departments of the Army, the Navy, and the Air Force

BUMED CIRCULAR LETTER 50-8

Subj: Armed Forces Institute of Pathology

     This joint letter, soon to be released and expected to appear in the 15 February 1950 issue of the Navy Department Bulletin, contains information concerning the authorization, organization, and functions of the Medical Department Armed Forces Institute of Pathology.

*   *   *   *   *   *

BUMED CIRCULAR LETTER 50-9   20 January 1950

From: Chief, Bureau of Medicine and Surgery
To: Commandants of Naval Districts and River Commands; and Fleet and Force Commanders

Subj: Medical and Dental Technical Equipment Maintenance Program; BuMed

Ref: (a) BuMed Circular Letter No. 48-70 dated 17 June 1948

     This letter states that pursuant to reference (a), subject program was established in all naval districts and in certain vessels of the fleets. Repair personnel billets have been established and actual assignment of personnel made as they became available. Because of the limited number of men trained in medical and dental technical repair service, it is imperative that their services be made available to all activities and vessels adjacent to their respective locations. Full cooperation by cognizant authorities in providing shop space and transportation, including travel orders where indicated, is desired and necessary. Addressees are requested to advise cognizant ships and stations of their commands of the availability of this service to them and the procedure for requesting it. Information is given for obtaining spare parts and tools. Each repair unit shall keep a detailed log of all repairs as a matter of record from which specific information may be extracted and furnished the Bureau when requested. Reference (a) is cancelled.

*   *   *   *   *   *

BUMED CIRCULAR LETTER 50-10   23 January 1950

From: Chief, Bureau of Medicine and Surgery
To: Naval Hospitals, Continental U. S.

Subj: Clinical Records for the Veterans Administration

Refs: (a) BuMed CirLtr 44-206
          (b) BuMed CirLtr 42-109
          (c) BuMed CirLtr 42-91

1. Reference (a) is hereby canceled and superseded by this letter.

2. The Bureau receives occasional requests from the Veterans Administration for clinical records on file at naval hospitals. These records are required by the Veterans Administration in connection with the adjudication of claims.

3. To simplify clerical procedures and in order to expedite action on claims in these cases the activities addressed are hereby authorized to lend clinical records of discharged veterans to the Veterans Administration, Washington, D. C., or to any Veterans Administration area or Regional Office upon request without reference to this Bureau. The Veterans Administration should be asked to return the records to the hospital for file after they have served their purpose.

4. Whenever the requested clinical records have been transferred elsewhere the request from the Veterans Administration should be forwarded to the activity having custody of the records and a copy of the forwarding endorsement furnished the originating Veterans activity for information.

5. Attention is invited to references (b) and (c) which authorized the naval hospitals to lend x-ray films and social history reports to the Veterans Administration for temporary use.   C. A. Swanson

* * * * * *

BUMED CIRCULAR LETTER 50-11   23 January 1950

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations having a Representative of the Medical Department on Board

Subj: Submission of NAVMED-F Report for Patients Remaining from 1949

Ref: (a) BUMED C/L 49-154 of 18 Nov 1949

    This letter directs that the NAVMED-F reports required by reference (a) be completed and mailed not later than 8 February 1950.

* * * * * *

BUMED CIRCULAR LETTER 50-12   30 January 1950

From: Chief, Bureau of Medicine and Surgery
To: Commanding Officers, U. S. Naval Hospitals

Subj: Naval Hospital Organization Charts and Personnel Listing Sheets;
        Procedure for the Regular Preparation and Submission of

Ref: (a) BuMed CirLtr No. 49-15

1. The personnel listing sheets required by paragraph 2(b) of reference (a) are no longer required.

2. Reference (a) is modified accordingly.

                           C. A. Swanson

* * * * * *

BUMED CIRCULAR LETTER 50-13   31 January 1950

From: Chief, Bureau of Medicine and Surgery
To: Commandant, Marine Corps
        Chief, Naval Air Training
        Commandants, All Naval Districts and River Commands

Subj: Establishment of Training Program for Food Handlers: Civilian
        and Military

Ref: (a) General Order Number 19

Encls: (1) Copy of SecNav ltr BUMED-7221 P11-1/J25 of 11 Jan 1950
        (2) Copy of FSA PHS ltr S of 12 Dec 1949
        (3) (SC) Kit of training aids
        (4) List of training aids to be distributed

1. Paragraph 17 of reference (a) states that District Commandants shall ensure that sanitation and health programs within their districts are adequately maintained. Enclosure (1) requires the establishment of food handlers' training courses. Enclosure (2) indicates the aid offered by the Public Health Service in this program.

2. Authoritative sources have been carefully canvassed and materials and ideas received have been collected and pertinent materials duplicated and included in a kit of training aids. These materials have been studied with a view to obtaining a consensus as to the training methods and scope of training most applicable to the needs of the Service. In the interest of uniformity and an orderly system of education of food handlers throughout the Navy, the following program is recommended:

a. The commands within each district should be fully informed concerning the contemplated program of instruction as soon as may be feasible and should be encouraged to participate in all phases of the work. Interdistrict and intercommand collaboration is recommended in the interest of economy and expedition of the program.

b. Courses of three types will be necessary:

(1) Advanced course for supervisors, instructors, and other key personnel.
(2) Basic course for all food handlers.
(3) Refresher courses as directed in enclosure (1).

c. Advantage should be taken of training courses of the desired level offered by public health activities or schools. Where such courses are not available a minimum of six hours of instruction should be given as indicated in paragraph b (1) to the supervisory and other key personnel such as medical officers and others who may be utilized as instructors and should cover all the principles of food sanitation contained in the outline of courses furnished in enclosure (3). At least four hours of additional training emphasizing teaching techniques should be given to the instructors. This additional instruction should also be made available to the supervisors on a voluntary basis. Instructors' training schools should be utilized where available.

d. As soon as a suitable nucleus of instructors and supervisory personnel have received training, classes as indicated in paragraph b (2) should be organized for food handlers. It is considered that these courses should consist of six hours of instruction. Instruction periods should be arranged insofar as may be possible to suit the convenience of the food handling establishment. Suitable orders or directives should be issued to require the attendance at these courses of every food handler and those supervisory personnel who have not attended the advanced course.

e. Visiting ships should be invited to take an active part and special classes scheduled to suit fleet operational plans where practicable.

f. Enclosure (4) lists all training aids and educational materials contained in enclosure (3) as well as others to be furnished. The sentence outlines of courses furnished may be adapted to various administrative or educational levels. These courses are sufficiently detailed and specific as to be adapted for reading to a class. It is intended that they be used as a guide to indicate the scope of instruction planned, or to assist in the preparation of instructional programs. These sample outlines are not expected to discourage the development of original training courses within the districts. Copies of the outlines of courses originating in the districts should be forwarded to the Bureau of Medicine and Surgery.

3. The Office of Industrial Relations has agreed that where Works Improvement Programs are in effect Industrial Relations Training Officers will furnish assistance, prepare and present certificates of attendance, provide technical advisors or instructors, and accomplish clerical and administrative duties under the direction of the district medical officer. Training Course Certificates, NAVEXOS 2290, Works Improvement Program, are available in district publication and printing offices and shall be used to certify the food handlers unless it is deemed more desirable to use a local public health training certificate.

4. The U. S. Public Health Service, and Regional Directors of the Public Health Service, have agreed to cooperate in the training program to the extent of available facilities. It is recommended that close liaison be maintained with the Public Health Service and with local health departments. Exchange of information, mutual utilization of organized courses of instruction, and reciprocal lending of training aids are advantages which can be expected to accrue from this cooperation.

5. Refresher courses to be conducted as a continual program should be arranged with sufficient frequency to ensure that all trainees currently connected with food handling attend at least annually. Appropriate notation of attendance in service records is recommended together with endorsement on original certificate showing date of refresher course. Entires in service records are accumulative and duplicate pages containing such entries shall not be forwarded to the Bureau of Naval Personnel until pages are filled.

6. Information as to the status of the program should be submitted to the Bureau of Medicine and Surgery in the Sanitary Reports.

C. A. Swanson

*   *   *   *   *   *

NAVY DEPARTMENT
BUREAU OF MEDICINE AND SURGERY
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

Permit No. 1048
NavMed-369 - ⅖ /50