

A Follow-Up Study of World War II Prisoners of War

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FROM THE
SERIES
WORLD WAR II
PRISONERS
OF WAR
MEDICAL PROBLEMS
M.
COOPER,
M. D., Z.
MAY 8 1956

A FOLLOW-UP STUDY OF WORLD WAR II PRISONERS OF WAR

by

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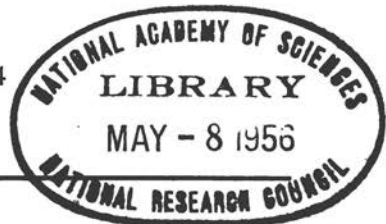
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Washington, D. C.

21 SEPTEMBER 1954



The work reported herein is part of the program of studies of the Follow-up Agency of the National Research Council developed by the Committee on Veterans Medical Problems in cooperation with the Veterans Administration, the Army and the Navy.

This investigation was conducted jointly by the Veterans Administration and the National Research Council (under Contract VAm-22734) upon the specific advice of the Committee on Veterans Medical Problems.

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Foreword

Following World War II, The Surgeon General, United States Army, Maj. Gen. Norman T. Kirk, suggested that a research program be organized to take advantage of the scientific potentialities of the recorded medical experience of the armed services in World War II, and the extensive observations which would subsequently be made on veterans in the hospitals and regional offices of the Veterans Administration. Research in the natural history of disease is greatly facilitated by certain characteristics of the medical experience of the Armed Forces, both in war and in peace, and of veterans as a class of beneficiaries of the Federal Government. Since 1946 the Veterans Administration has placed great emphasis upon the encouragement of essential investigations in this area. In war especially, but also in time of peace, the military personnel comprise a large population with a great diversity of stress, trauma, and disease, in which each illness or injury generates a permanent record; all such episodes (or a fair statistical sample thereof) are indexed by means of punched cards, and there also exists a uniquely complete and centralized reservoir of pathological material. The veteran population is now in excess of 20 million and is both more easily located and more readily motivated to participate in specific studies than any other large segment of the United States population. It is served by an integrated system of medical care, with emphasis upon service-connected illness or injury, administered by 172 hospitals with a rated aggregate capacity in excess of 118,000 beds, by clinics in 69 regional offices, and by many additional supplementary medical and dental services.

Several efforts had previously been made to extract scientific information on the natural history of disease from the medical experience of World War I, supplemented by the later records of what was then called the Bureau of Veterans' Affairs. This led to the publication of special reports in the History of the United States Army in the World War. However, no systematic program had been established and the opportunity was never fully realized.

In 1946 Maj. Gen. Paul R. Hawley, then Chief Medical Director of the Veterans Administration, requested that the National Research Council advise the Veterans Administration on the organization and conduct of its developing program of medical research. For this purpose the Committee on Veterans Medical Problems of the National Research Council was established. This Committee was charged with the broad responsibility for initi-

ating and fostering a general program of medical follow-up studies based on experience with the military and veteran population. Under this Committee was organized the Follow-up Agency of the National Research Council to carry out the staff functions associated with the planning and organization of research projects, arranging access to medical records, and providing statistical analysis. The Veterans Administration has provided the direct financial support for the majority of the studies in this program and the armed forces have provided strategic support in the form of access to necessary records and ancillary services. Many Federal, State, and private agencies have also given generous assistance to the work as required.

The program is a general one, its unity arising out of the availability of a research tool of broad applicability in clinical medicine, especially in the area of the natural history of disease. Some studies have been based entirely on existing records (military, clinical, pathological, mortality, disability, etc.) while in others the recorded information has been supplemented by intensive laboratory and clinical observations.

The Veterans Administration is deeply indebted to the members of the Committee on Veterans Medical Problems for their vision and foresight in organizing and directing this program of medical follow-up studies.

Much of the product of the program will be found in medical periodicals appropriate to the subjects of investigation. However, some of the studies are of such magnitude as to require that they be reported at greater length than would be possible even in a series of journal articles. The Veterans Administration has, therefore, inaugurated a series of monographs as the most effective means of presenting the results of these larger studies.



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I. INTRODUCTION

1. BACKGROUND AND PLAN OF THE STUDY

Since the end of World War II the experiences of imprisonment in Japanese and German prison camps during that conflict have been described in detail, and voluminously documented by participants and observers. Many ex-prisoners were hospitalized at liberation for study and treatment. General policies have been put into effect by such agencies as the War Claims Commission and the Veterans Administration to provide special compensatory assistance in relation to duration of imprisonment, and to furnish medical care, rehabilitation, and disability compensation commensurate with the kind and degree of impairment persisting after liberation.

The present study, which was undertaken by the National Research Council at the request of the Veterans Administration, represents an attempt to fill the need felt by the responsible Federal agencies, primarily the WCC and the VA, for a current evaluation of the ex-prisoners with respect to how they have fared since liberation, and to what extent their prison experience has affected their survival, their health, and their adjustment to civilian life. The study differs in one important respect from other investigations of former World War II prisoners, namely, in being designed to examine a representative sample of all ex-prisoners. The numerous studies of former prisoners thus far made have dealt with more or less selected groups of men; e. g., those seen by an individual examiner, those passing through a particular hospital, those exhibiting a particular condition of interest, or those available for study in a particular locality. Study of such groups provides important information, but does not, as a rule, yield facts or indexes which are readily applicable to ex-prisoners in general.

Another important feature of the present study lies in its use of control groups against which to evaluate the estimates derived from observations on the prisoners. Whatever the consequences of imprisonment may be, they are not likely to be grossly different in *kind* from the effects of combat, disease, malnutrition, and other adverse experiences encountered outside of prison camps. Rather, the important effects of imprisonment will manifest themselves as differences in severity or duration or both, so that the bases of comparison which can be provided only by suitable control groups are indispensable.

One further major characteristic of this study is its total dependence on *records*, in particular records of death, hospitalization, and disability, and on the information obtainable from surviving ex-prisoners by means of questionnaires. The efficiency of record study of this kind has been fully demonstrated in the experience of the Follow-up Agency's program. There was little question that the best first approach to the problem of determining the lasting effects of imprisonment would be an exploratory record study designed to elucidate the broader facts of survival, mortality, cause of death, hospitalizations, disability, and health and work status. Such observations would not only permit evaluations of interest in themselves, but would be likely to indicate profitable areas for more intensive clinical and laboratory study, and, equally important, to point out where further study may not be worth while.

2. THE ROSTERS STUDIED, WITH REFERENCE TO THE DESIGN OF THE STUDY AND SAMPLING CONSIDERATIONS

The rosters of ex-prisoners and controls which make up the materials of the study were expressly limited to white Army males, wholly as a matter of convenience to avoid needless multiplication of variables. This limitation, however, encompasses by far the largest demographically homogeneous segment of World War II military personnel.

The rosters selected and their size are shown in table 1. The numbers of cases were dictated primarily by two considerations: (a) the need to place upper limits upon them because of anticipated costs and available facilities, and (b) the necessity to work with sufficient numbers to insure the detection of differences of interest. The total of nearly 8,000 cases was considered to be optimum with respect to these opposing limitations.

a. The ex-prisoners

The total number of Army and Air Force personnel captured or interned during World War II, the number dying of wounds and other causes during imprisonment, and the number returned alive to military control, by theater of capture, are shown in table 2. A punchcard file, prepared by the Army, of all prisoners liberated alive, was the source of the samples of ex-prisoners selected.¹ The "European"² prisoners (PWE) were selected from those captured in the Mediterranean (MTO) and European (ETO) theaters, the "Pacific" prisoners (PWJ) from those captured in the Pacific theaters, most of whom (95 percent) were taken in the Southwest Pacific area (SWPA). In either case the total cards representing the survivors of those imprisoned in these theaters were first reduced to white Army males, and from these the samples for study were chosen by selection of random digits in the service

¹ This file, although retained in the custody of the Army, was housed in the offices of the War Claims Commission for that agency's use. The WCC, with the permission of the Army, generously permitted the NRC to reproduce the file for the purposes of this study.

² This term, while not descriptively precise, is convenient as a brief designation, and will be used hereafter as here defined.

serial numbers, in such a way as to yield samples of approximately 2,000. After this selection, some further eliminations were made of personnel of services other than Army and Air Force and of the Armed Forces of other nationalities; a few men, otherwise eligible, whose imprisonment lasted only a few days; and duplicates. Each prisoner group was divided into a larger portion (group A) and a smaller (group B), in the ratio of 3 to 1, Group B to be used in a relatively complete record follow-up study of hospitalization and disability, including a questionnaire survey. In the study of mortality, Group A was added to Group B to provide cases sufficient in number for the reliable observation of mortality differences of interest. The separation into the two groups was made with the original samples, by selecting every fourth case from the sample file arranged alphabetically by name. The eliminations described above were undertaken subsequent to this subdivision, since the two parts of each roster were processed as separate groups, and the facts resulting in eliminations were uncovered in the course of examining the records of individuals.

Some delays and handicaps were encountered in processing Group A of both rosters. At the time of the closeout date for tabulation, 162 cases of PWJ Group A had not been processed by the NRC staff located at the Army Records Center in St. Louis and it was decided not to wait for them, since there was no reason to suspect that bias was likely to result from excluding these men from follow-up for mortality. In the PWE Group A, it was discovered that the records of 156 Air Force personnel were not accessible at that time, and these also had to be eliminated. It is likely that these men were in service and alive. As will be seen, the resulting slight mortality bias in the remainder has no effect on the comparisons to be made.

The figures shown in table 1 for numbers of cases in the PWJ's and PWE's are the active cases remaining on the rosters after the eliminations described above were made.

TABLE 1
The Rosters of the Study

| Roster | Symbol | Total | Group | |
|-------------------------------|--------|-------|----------------|----------------|
| | | | A ¹ | B ² |
| Pacific prisoners..... | PWJ | 1,850 | 1,358 | 492 |
| European prisoners..... | PWE | 1,804 | 1,342 | 462 |
| Pacific combat controls..... | WJ | 1,075 | 554 | 521 |
| European combat controls..... | WE | 998 | 537 | 461 |
| General controls..... | C | 1,964 | 1,964 | ..... |
| Total..... | | 7,691 | 5,755 | 1,936 |

¹ Used in study of mortality only.

² Used in complete study, including mortality.

TABLE 2

Army and Air Force Personnel Captured or Interned During World War II, Dying During Imprisonment, and Returned to Military Control, by Theater of Capture

| Area and theater | Captured or interned | | | |
|--------------------------|-----------------------|-----------------------------|----------------------------------|------------------------------|
| | Total | Died of wounds and injuries | Died of other causes (nonbattle) | Returned to military control |
| Total | ¹ 120, 977 | 453 | 9, 098 | 111, 426 |
| Europe, total | 93, 653 | 257 | 576 | 92, 820 |
| ETO | 73, 535 | 194 | 532 | 72, 809 |
| MTO | 20, 118 | 63 | 44 | 20, 011 |
| Pacific, total | 24, 992 | 182 | 8, 452 | 16, 358 |
| Other areas | 2, 332 | 14 | 70 | 2, 248 |

¹ Excludes 3,102 classified as "killed in action."

Source: *Army Battle Casualties and Nonbattle Deaths in World War II, Final Report*, Department of the Army, 1 June 1963.

b. The combat controls

The composition of the combat controls is of particular importance in the plan of the study. As pointed out, the implications of all observations on the ex-prisoners can be evaluated only in relation to equivalent observations on the controls, and to serve this role the controls, in turn, need to reflect the characteristics and relevant experiences of the ex-prisoners other than the experience of imprisonment. While absolute comparability in all details is a practical impossibility, most of the shortcomings of any group selected for controls, provided they are not major on some critical point, can always be overcome or minimized to any desired degree, given sufficient detailed knowledge of the dissimilarities between study and control groups.

The essential characterization of combat control rosters which governed their selection was specified to be the presence of their members in units engaged in combat, in the theaters in which the prisoners were captured, during the periods of calendar time when the captures occurred. These conditions could be readily met in the European combat controls, but not so readily in the Pacific group. The Pacific prisoners shown in table 2 are made up very largely of the men who defended the Philippines in the early months of World War II and who surrendered at Bataan and Corregidor in April and May 1942. Virtually all survivors were captured, so that no controls could be selected to match them either as to time of capture or conditions of combat. The Pacific combat controls had, of necessity, to be chosen from units which entered combat later, and which, during

the course of the Pacific campaigns experienced severe combat conditions, but suffered relatively few losses by capture.

(1) Selection of the Pacific combat controls

The prisoners taken in the Philippines included a larger proportion of service units than is characteristic of Army forces of comparable size. Accordingly, the WJ group was specified to contain an appropriate representation of signal, ordnance, quartermaster, engineer, and medical units, but the greater part of the sample was selected from combat units: 66 percent from infantry regiments and 16 percent from field artillery battalions. A sample of equal composition by arm or service was taken from each of the three divisions which were the first to engage the enemy in the Pacific after the fall of the Philippines. The names and service serial numbers were obtained from payroll rosters of specified months, so that the payroll month determined the date of selection; i. e., the point of time taken as analogous to the date of capture of the prisoners. Air Force personnel are represented in the sample by members of the Fifth Air Force selected from 2 bomber and 2 fighter squadrons, again taking the individuals from the payroll of a particular month. The sample was matched with the sample of Pacific prisoners in proportion of ground and Air Force personnel and of officers and enlisted men.

The major units from which the sample was taken and the payrolls used are:

| <i>Major unit</i> | <i>Payroll month of selection</i> |
|-----------------------------|-----------------------------------|
| 25th Infantry Division..... | August 1942 |
| 32d Infantry Division..... | May 1942 |
| America Division..... | September 1942 |
| Fifth Air Force..... | March 1943 |

(2) Selection of the European combat controls

The sample of European combat controls represents forces engaged in both ETO and MTO. For the selection of ETO ground force controls (ground forces make up 65 percent of the European prisoner sample) the successive weekly battle casualty rates of all infantry divisions engaged in the European campaign were examined, and 8 divisions were identified which experienced conspicuously high WIA rates during the 4 successive weeks of a particular calendar month. While such high casualty rate months for a given unit often correspond to the periods when captures are also numerous, this agreement is not always found, since high WIA rates may occur during intense and rapid offensive operations when losses by capture may be relatively low.

Weekly or monthly divisional casualty rates for units engaged in MTO were not at hand when the MTO portion of the sample was selected. By reference to summary statements of division combat chronicles (1), 4 infantry divisions were selected which had combat activity beginning early in the Mediterranean campaign and continuing at least through the invasion of

Italy and the end of German resistance in northern Italy. Three of these divisions subsequently participated also in the invasion of southern France and the European campaign to the end of the war. For each of the 4 divisions a calendar month was chosen in which the division engaged in intensive combat activity, with the 4 months thus selected distributed in time to coincide approximately with periods when losses by capture in MTO were numerous.

From these 8 ETO and 4 MTO infantry divisions, during the months characterized as described above, there was selected a number of men representing in total a proportion of the control group similar to the proportion of ground forces in the sample of prisoners. To enhance the probability of selecting men actually engaged in combat, the selections were made from rifle companies only. The source of names was the payroll roster of the unit for the month in question, from which were taken random subsamples of officers and enlisted men in the proportions in which they appeared among the ground forces of the prisoners.

One minor discrepancy resulting from the exclusive use of rifle companies for the controls was that service units were not represented, whereas, in the prisoners about 15 percent of the ground force personnel belonged to such units at the time of capture. This slight difference is assumed to be inconsequential.

Air Force selections were also related to chronicled periods of considerable combat activity, rather than periods determined by reference to specific casualty rates. Flight personnel in bomber and fighter squadrons were taken from payroll rosters of 2 air forces in MTO and 3 air forces in ETO. Selections were made in a manner similar to that employed for ground forces, in such a way as to approximate the time distribution of dates of capture and the proportion of officers and enlisted men in the sample of prisoners.

The major units from which the European combat controls were taken and the payrolls used are:

| <i>Major unit</i> | <i>Payroll month of selection</i> |
|-----------------------------|-----------------------------------|
| MTO: | |
| 3d Infantry Division..... | September 1943 |
| 34th Infantry Division..... | February 1943 |
| 36th Infantry Division..... | January 1944 |
| 45th Infantry Division..... | February 1944 |
| Ninth Air Force..... | August 1943 |
| Twelfth Air Force..... | May 1944 |
| ETO: | |
| 2d Infantry Division..... | August 1944 |
| 4th Infantry Division..... | November 1944 |
| 5th Infantry Division..... | September 1944 |
| 26th Infantry Division..... | January 1945 |
| 30th Infantry Division..... | July 1944 |
| 63d Infantry Division..... | April 1945 |
| 78th Infantry Division..... | March 1945 |
| 94th Infantry Division..... | February 1945 |

| <i>Major unit</i> | <i>Payroll month of selection</i> |
|--------------------------|--|
| Eighth Air Force----- | } October 1943 } April 1944 |
| Ninth Air Force----- | |
| Fifteenth Air Force----- | } February 1944 } July 1945 } September 1944 |

c. The general controls

In the considerations of study design, it was anticipated on *à priori* grounds that two broad, somewhat opposing sets of factors would be operative in determining observed results in the area of mortality and survival. The effects of imprisonment could be presumed to lead to an excess of mortality, if survival were to be affected at all, while the selective factors which govern the choice of men for military service could be assumed to differentiate a class initially favored as to survival. While the factors favoring survival at the outset are common to both ex-prisoners and combat controls, there was not directly available, at least for the contemplated calendar period of observation, appropriate measures of the actual baseline of mortality expectations upon which the consequences of combat and prison experience would be superimposed. Although knowledge of this underlying mortality was not essential for the specific evaluations to be undertaken, it appeared that these evaluations would gain in meaning if they could be put upon an absolute rather than a purely relative basis.

Thus the possibility of three mortality levels was visualized: one associated with imprisonment, one with combat and related military experiences, and one with medical selection for military service. In order to measure the third level, a random sample of World War II Army officers and enlisted men separated from the service between January 1942 and August 1945 was set up as a "general control"—Group C. This was taken from the VA's 1-percent sample of World War II separatees, by selecting random digits in the service serial number in accordance with a sampling ratio designed to yield about 2,000 individuals. The roster thus constructed was used only in the mortality study.

3. DEFINITIONS OF TERMS USED IN THE REPORT

Certain symbols and terms used for convenience in this report, and their definitions, are as follows:

| <i>Symbol or term:</i> | <i>Definition</i> |
|------------------------|---|
| PWJ----- | Prisoners of war taken by the Japanese in SWPA and other Pacific theaters, and alive at liberation. |
| PWE----- | Prisoners of war taken in ETO and MTO, and alive at liberation. |
| WJ----- | Pacific combat controls. |
| WE----- | European combat controls. |
| C----- | General controls—cross-section sample of World War II white male veterans. |
| A group----- | The portion of a roster used only for mortality study. |
| B group----- | The portion of a roster used for complete study, including mortality. |

| Symbol or term: | <i>Definition</i> |
|--------------------------|--|
| ETO----- | European theater of operations. |
| MTO----- | Mediterranean theater of operations. |
| SWPA----- | Southwest Pacific area. |
| SH----- | Service hospital. |
| VAH----- | VA hospital. |
| Selection (date of)----- | PWJ and PWE—date of capture. WJ and WE—first day of payroll month of selection. |
| Reference point----- | Date of entry into observation for follow-up: PWJ and PWE—date of liberation. WJ and WE—date of end of hostilities (15 August 1945 and 8 May 1945, respectively) or date of separation if that was earlier. C—same as WJ. |

4. CHARACTERISTICS OF THE ROSTERS OTHER THAN THOSE RELATED TO THE EXPERIENCE OF IMPRISONMENT

All of the known characteristics of the ex-prisoner and combat control rosters that might determine the nature or degree of their postwar medical and economic status, or their probability of survival, were examined, and used as the basis of systematic comparisons between the two prisoner groups and each prisoner group and its combat controls. The factors for which information adequate for such analysis was available (for the most part, only in the B group of each roster) are as follows:

- a. Age at reference point.
- b. Marital status at entry.³
- c. Geographic region of residence at entry.
- d. Civilian occupation prior to service.
- e. Height at entry.
- f. Weight at entry.
- g. Education at entry.
- h. Service prior to entry.
- i. Component.
- j. Number of service hospital admissions prior to selection.
- k. Arm or service at selection.
- l. Rank at separation.

Table 3 gives, in summary form, the percentage distribution of each of these factors for each of the four groups, and indicates the level of statistical significance of the differences between PWJ's and PWE's, PWJ's and WJ's, and PWE's and WE's. As would be expected from the facts of the origins of these groups, the PWJ's differ from all the other groups in several characteristics, but their dissimilarities with respect to the PWE's are, for the purposes of the study, of relatively little importance.

³ I. e., date of induction or enlistment. As used herein, for men with continuing service which began before World War II, this refers to the last enlistment prior to World War II which includes the World War II period of service.

The facts of primary interest here concern the two comparisons: PWJ v. WJ and PWE v. WE.

PWJ v. WJ

These two groups differ significantly with respect to the following factors: age composition, residence prior to service, education prior to service, arm or service at selection, the proportion with a history of service prior to the World War II enlistment, component, and frequency of service hospital admissions prior to selection. They do not differ significantly with respect to marital status, civilian occupation, height, weight, or rank at separation.

TABLE 3

Comparisons of the Rosters With Respect to Their General Characteristics

| Characteristic | Roster | | | | Significance of difference (value of P) | | |
|--|--------|-------|-------|-------|---|-----------|-----------|
| | PWJ | WJ | PWE | WE | PWJ v. PWE | PWJ v. WJ | PWE v. WE |
| (a) Age at reference point | | | | | <.01 | <.01 | <.05 |
| Number | 492 | 521 | 462 | 461 | | | |
| Percent, total | 100.1 | 99.9 | 100.1 | 100.0 | | | |
| 18-19 | .6 | 0 | 4.1 | 4.3 | | | |
| 20-24 | 22.8 | 18.4 | 48.1 | 38.8 | | | |
| 25-29 | 47.8 | 61.6 | 35.1 | 38.0 | | | |
| 30-34 | 17.5 | 15.5 | 10.0 | 12.6 | | | |
| 35-39 | 7.1 | 3.6 | 2.8 | 5.9 | | | |
| 40 or more | 4.3 | .8 | 0 | .4 | | | |
| (b) Marital status at entry | | | | | <.01 | >.05 | >.05 |
| Number | 489 | 517 | 461 | 459 | | | |
| Percent, total | 100.0 | 100.0 | 100.0 | 100.0 | | | |
| Single | 90.2 | 90.1 | 78.5 | 79.7 | | | |
| Married, divorced, widowed | 9.8 | 9.9 | 21.5 | 20.3 | | | |
| (c) Geographic region of residence at entry | | | | | <.01 | <.01 | >.05 |
| Number | 485 | 518 | 450 | 457 | | | |
| Percent, total | 100.1 | 100.0 | 100.0 | 100.0 | | | |
| New England and Middle Atlantic | 14.0 | 26.6 | 30.7 | 31.1 | | | |
| South Atlantic and East South Central | 12.8 | 12.2 | 18.7 | 21.7 | | | |
| East North Central and West North Central | 18.6 | 39.4 | 30.9 | 30.6 | | | |
| West South Central | 25.2 | 8.3 | 11.3 | 10.3 | | | |
| Mountain and Pacific | 29.5 | 13.5 | 8.4 | 6.3 | | | |
| (d) Civilian occupation prior to service | | | | | >.05 | >.05 | >.05 |
| Number | 479 | 507 | 448 | 451 | | | |
| Percent, total | 100.0 | 100.0 | 99.9 | 100.1 | | | |
| Professional, proprietors, managers | 7.3 | 5.7 | 5.1 | 5.8 | | | |
| Clerical, sales, craftsmen, protective service | 27.8 | 24.1 | 26.3 | 25.1 | | | |
| Farmers, operators, service, strudents, laborers | 64.9 | 70.2 | 68.5 | 69.2 | | | |

TABLE 3

Comparisons of the Rosters With Respect to Their General Characteristics—Continued

| Characteristic | Roster | | | | Significance of difference (value of P) | | |
|---|--------|-------|-------|-------|---|-----------------|-----------------|
| | PWJ | WJ | PWE | WE | PWJ v. PWE | PWJ v. WJ | PWE v. WE |
| (e) Height in inches at entry | | | | | >.05 | >.05 | >.05 |
| Number | 486 | 520 | 462 | 459 | | | |
| Percent, total | 99.9 | 100.0 | 100.0 | 100.0 | | | |
| 60-65 | 11.5 | 15.0 | 15.8 | 20.3 | | | |
| 66-69 | 54.9 | 56.9 | 56.5 | 55.1 | | | |
| 70 or more | 33.5 | 28.1 | 27.7 | 24.6 | | | |
| (f) Weight in pounds at entry | | | | | >.05 | >.05 | >.05 |
| Number | 481 | 519 | 462 | 459 | | | |
| Percent, total | 100.1 | 100.0 | 99.9 | 100.0 | | | |
| 124 or less | 6.7 | 8.1 | 8.4 | 10.7 | | | |
| 125-149 | 46.6 | 45.5 | 42.4 | 42.9 | | | |
| 150-159 | 20.4 | 16.2 | 22.7 | 18.7 | | | |
| 160-179 | 17.9 | 20.2 | 19.0 | 19.2 | | | |
| 180 or more | 8.5 | 10.0 | 7.4 | 8.5 | | | |
| (g) Education at entry | | | | | <.01 | <.05 | >.05 |
| Number | 490 | 518 | 461 | 460 | | | |
| Percent, total | 100.0 | 100.1 | 99.9 | 100.0 | | | |
| 8 years or less | 22.7 | 28.4 | 23.6 | 30.4 | | | |
| 9-11 years | 31.6 | 28.6 | 28.8 | 27.0 | | | |
| 12 years | 24.9 | 28.6 | 35.6 | 29.1 | | | |
| More than 12 years | 20.8 | 14.5 | 11.9 | 13.5 | | | |
| (h) Service prior to entry | | | | | <.01 | <.01 | >.05 |
| Number | 492 | 521 | 462 | 460 | | | |
| Percent, total | 100.0 | 100.0 | 100.0 | 100.0 | | | |
| No prior service | 78.3 | 93.7 | 95.7 | 96.7 | | | |
| Prior service | 21.7 | 6.3 | 4.3 | 3.3 | | | |
| (i) Component | | | | | <.01 | <.01 | >.05 |
| Number | 492 | 521 | 462 | 461 | | | |
| Percent, total | 99.9 | 100.0 | 100.0 | 100.0 | | | |
| Regular Army | 71.3 | 30.9 | 15.6 | 18.4 | | | |
| National Guard | 8.5 | 18.8 | 3.2 | 4.6 | | | |
| Army of the U. S. | 20.1 | 50.3 | 81.2 | 77.0 | | | |
| (j) Number of service hospital admissions from entry to selection | | | | | >.05 | <.05 | >.05 |
| Number | 492 | 521 | 462 | 461 | | | |
| Percent, total | 99.9 | 100.0 | 100.1 | 100.0 | | | |
| 0 | 42.3 | 50.3 | 45.7 | 44.3 | | | |
| 1 | 26.8 | 25.9 | 29.9 | 28.4 | | | |
| 2 | 15.4 | 12.3 | 14.1 | 14.5 | | | |
| 3 or more | 15.4 | 11.5 | 10.4 | 12.8 | | | |
| (k) Arm or service at selection | | | | | <.01 | <.01 | <.01 |
| Number | 492 | 521 | 462 | 461 | | | |
| Percent, total | 100.0 | 100.0 | 100.1 | 100.0 | | | |
| Ground combat | 53.5 | 65.1 | 55.0 | 65.1 | | | |
| Services | 19.5 | 13.2 | 10.0 | .2 | | | |
| Air Corps | 27.0 | 21.7 | 35.1 | 34.7 | | | |
| (l) Rank at separation | | | | | | | |
| Number | 489 | 519 | 461 | 458 | | | |
| Percent, total | 99.9 | 100.0 | 100.0 | 100.0 | | | |
| Field grade officer | 6.3 | 4.0 | 1.7 | 1.1 | }<.01 | >.05 | >.05 |
| Company grade officer | 4.7 | 6.6 | 9.3 | 11.6 | | | |
| Sergeant above T4 | 32.5 | 28.7 | 17.6 | 24.0 | }<.01 | >.05 | .01 |
| Sergeant T4 and below | 56.4 | 60.7 | 71.4 | 63.3 | | | |

Recognized differences as between Regular Army men and inductees focus attention on the difference in makeup by component as a possible primary difference to which the others are in greater or less degree secondary. In the PWJ's, 71.3 percent are Regular Army men, and 20.1 percent are inductees, the remainder being federalized members of the National Guard. In the WJ's, 30.9 percent are members of the Regular Army, and 50.3 percent inductees. This very large difference with respect to component does not, however, account for the other differences.⁴ All of them persist within component-pure subgroups (not necessarily in every such pure subgroup), and for three characteristics differences appear in the component breakdown that were not otherwise observed. Distributions by both education and civilian occupation differ significantly as between PWJ's and WJ's, but among inductees only. In this subgroup the Pacific prisoners had more years of school and held jobs at higher economic levels than their controls in the same subgroup. Likewise significant differences in rank, but of opposite kind, appear in Regular Army men and in inductees. In the former the ex-prisoners tend to be of lower rank than their controls while in the latter the ex-prisoners have an appreciably greater proportion of officers than their controls.

The Pacific prisoners have a higher proportion of men in service branches and a lower proportion of combat forces than are characteristic of Army units of comparable size. This distinction in arm or service composition appeared also to be a possible primary basis for differences in other factors, but this assumption also proved to be unfounded. Distributions by component or by age, for example, are significantly different between PWJ's and WJ's, within arm or service subgroups.

Certain of the observed differences other than those of component and branch also persist when such other factors are compared in relation to each other. In particular, the age differences between PWJ's and WJ's are found within rank groups, within education groups, in both single and married men, in the lowest (numerically the largest) occupation group, and in men both with and without service prior to the war. This age difference consists, for the most part, of a larger proportion of men 20-24 years of age, and a smaller proportion 25-29 in the ex-prisoners than in the controls. Older ages are in general about equally represented in the two groups.

In summary, examination of the differences in underlying characteristics between the Pacific prisoners and their combat controls shows that in several respects the dissimilarities are appreciable and also that for the most part they are not interdependent. It is clear that in the analysis and interpretations of follow-up observations certain of these differences need to be taken into account. Several of the dissimilarities appear to be unimportant, either because of the general nature of the factor or because of

⁴The numerous tables and analyses on which this discussion is based are not included in the report but are available for examination.

the kind or magnitude of the difference. These are geographic region of residence, education prior to service, service hospital admissions prior to selection (clearly a function of the difference in preselection service), and arm or service. On the other hand, age, component, and prior service appear to be factors relevant to mortality, morbidity, disability, and adjustment expectations. The effects of the differences in these factors will be seen in later analyses, where the differentials are controlled as required. Of special interest is the possibility of differences between Regular Army men and inductees, particularly in such areas as survival and endurance of stress, by virtue of differences in training, experience, and possibly motivation and orientation toward the exigencies of military hazards.

PWE v. WE

In this comparison the only difference of importance is in age composition. The difference in this instance is not great, however, and in any event age is routinely treated on a differential basis, particularly in mortality.

The difference in arm or service, in consequence of using only rifle companies as the source of ground force personnel in the combat controls, resulting there in a disproportionately low representation of service forces, does not appear to be relevant to the function of the control group. With respect to rank, while officers and enlisted men are in about the same proportion in the two groups, having been so selected in the controls, in the latter group there is some under-representation of the lower enlisted grades. The difference here is believed not to be of consequence.

PWJ v. PWE

Although underlying differences between the two prisoner groups are not of major importance to the essential analytical requirements of the study, it is instructive to examine these differences briefly and indicate their general nature. The PWJ's differ from the PWE's in all of the factors by which the former differ from the WJ's, and also in marital status at entry and rank at separation. In the case of rank, however, the difference is confined to grade differences among officers on the one hand and among enlisted men on the other; officers and enlisted men as groups are in the same proportion in the two rosters.

The conspicuous differences between the samples of Pacific and European prisoners are in age distribution, service prior to World War II, component, and arm or service. In each of these factors the differences are greater than those seen in the comparison of the PWJ's with their controls: the European group is considerably younger, has a much smaller proportion of men with prior service and of Regular Army men (these two factors are of course related), and, with respect to branch, a smaller proportion of men in service units and a larger proportion of Air Corps personnel, than the Pacific prisoners.

With respect to component as a factor of some special interest, Regular Army men, who comprise 71 percent of the PWJ's, make up only 16 percent

of the PWE's; inductees are 20 percent of the former and 81 percent of the latter.

5. FOLLOW-UP METHODS

The general methods of record follow-up used in this study are similar to those employed in a number of other studies in the program of the NRC Follow-up Agency, and have been previously described (2). It will suffice here to describe the steps by which the data were gathered and indicate their sources and nature. Other more specific aspects of method are discussed in later sections devoted to particular types of follow-up observations.

In the A group of each roster, which includes the whole of roster C, the sole interest is in mortality, for which only a limited amount of information was sought: date of selection, date of reference point, age at reference point, date of separation from service, date of death, and cause of death. Except for the facts of death this information was obtained from retired service records in the Army Records Center in St. Louis or active records at the Pentagon. In this procedure the fact and dates of prisoner status were verified for the two ex-prisoner groups. For the combat controls, the names were selected from specified payrolls previously described (the payroll month determining the date of selection), and the other facts were obtained from individual service records. For the C controls, the information required, age and date of separation, were available directly from the punchcards representing the VA sample of World War II separatees. For all cases, including those in the B groups, information on deaths was obtained from VA records. The rationale and validity of this procedure are discussed in the section on mortality.

The B groups of the ex-prisoners and combat control rosters were made the subject of intensive record search and follow-up by record matching, and for the prisoners, of a complete questionnaire survey of survivors. Army service records and service hospital clinical records were reviewed and the required information on preservice, service and medical history up to separation were abstracted and coded. Special forms were sent to VA regional and district offices, where all hospital records contained in VA claims folders, including the service clinicals transferred to VA in connection with disability compensation and other claims, were abstracted, and the dates, diagnoses, and operations of each admission were entered on the forms. The current VA rating for disability compensation and pension were also entered on these forms. The facts of hospitalization were coded on a form which provides for systematizing the information in yearly intervals over the 6 years of follow-up, with a specially designed disease and injury code ⁵ specifying diagnostic categories at a reasonable level of detail.

⁵ Based on the International Statistical Classification of Diseases, Injuries, and Causes of Death—Sixth Revision.

The questionnaire sent to surviving ex-prisoners is shown in the appendix, and its contents are described in section V.

The sections devoted to hospitalization, disability, and questionnaire findings discuss the nature, completeness, and validity of the observations derived by these procedures.

II. MORTALITY AFTER LIBERATION

1. THE SURVIVORS OF IMPRISONMENT AT THE BEGINNING OF FOLLOW-UP

The two groups of ex-prisoners entered the period of follow-up observation with very different histories of mortality during imprisonment. The Pacific group had averaged 38.4 months in prison camps (86 percent were held 3 years or more), and 34 percent had died before liberation. The European group had averaged 10.3 months in captivity (84 percent were held 18 months or less) and 1 percent had died before liberation. In either case deaths from wounds received prior to capture are not included. These experiences represent, roughly, crude annual death rates of 106 per 1,000 in the PWJ's and 7 per 1,000 in the PWE's. The corresponding rates for the equivalent periods in the combat controls, excluding men killed in combat,¹ are 3.5 per 1,000 in the WJ's and 4.8 per 1,000 in the WE's. Among white males of similar age in the total population, the annual death rate was roughly 2.3 per 1,000 during the World War II period.

The adverse conditions in Japanese prison camps responsible for a mortality excess of such magnitude can be assumed to have had strong selective effects. A question of special interest is whether those who survived such conditions, presumably by virtue of exceptional viability, nevertheless bear lasting residuals of the experience severe enough to affect their survival unfavorably in the long run.

2. METHODS IN MORTALITY AND SURVIVAL STUDY

Reliance on past experience in determining the facts of death and the survival status of service personnel and veterans has permitted in this area the use of methods of great simplicity and known reliability. The experience in question has demonstrated that the VA's records of service and veteran deaths are remarkably complete. The specific evidence, which has been previously described (2), is briefly as follows:

In the pilot study (2) in which most of the methods of record follow-up were developed, and in a study of testicular tumors (3), a total of 3,000² World War II veterans were followed, and for all but 1.2 percent the fact of death or survival was verified. Survival was verified either through up-to-date VA records, or through other resources, including a question-

¹ If those killed in action are included, the annual rate per 1,000 is 27.6 for the WJ's and 95.4 for the WE's.

² The pilot study dealt with 5 World War II rosters numbering 2,078 men (Hodgkin's disease—388, diabetes mellitus—176, duodenal ulcer—612, scarlet fever—497, controls—455) who were followed as of 30 June 1948. In the testicular tumor group, 899 men diagnosed in 1940-47 were followed as of 31 December 1949.

naire. From all resources a total of 675 deaths were reported, and all of these deaths were found recorded as such in VA files. In 1953 the 22 untraced men in the pilot study of 1948 were again searched in VA records and 10 were found recorded as living considerably later than the original cutoff date, as a result of their having reestablished contact with the VA. An additional veteran was found recently dead, the notice of death being the means of his coming again to the attention of VA. In the two studies combined, 76 percent of the roster members were verified as living. Of the remainder, 96 percent were found recorded in VA files as dead, so that at least that proportion of all possible deaths were known to VA. The figure provides a reliable correction factor in situations where the validity of a small mortality difference might raise the question of incomplete reporting of deaths.

3. ANALYSIS OF MORTALITY

a. The controls as mortality standards

In order to gain precision in certain details of the mortality comparisons, it has been useful to introduce an independent set of mortality standards. When the sizes of samples were determined for the prisoner and control groups, attention was paid to the question of their power to detect reasonably small mortality differentials, but with recognition of the limitations imposed by costs. The sample sizes agreed upon are adequate to show mortality differences of interest for the total samples over the whole observation period. However, for the measurement of differences by age in narrower time intervals, a standard of comparison was required which has more stability in these details than can be found in the samples. For this purpose the 1949 life table for U. S. white males was arbitrarily selected on the assumption that, lying somewhat beyond the midpoint of the observation period, it would more closely approximate the presumably more favorable death rates of veterans than earlier population experience.

As a first step, life tables covering the 6 years of mortality observations for each of the 3 control groups were compared with the 1949 mortality experience of U. S. white males of the same age composition, by applying the annual age-specific mortalities (for 5-year age groups) of the 1949 life table to the corresponding cohorts of the control groups, over 6 successive years. These and other mortality analyses were confined to the men 20-54 years of age at the reference point; i. e., the point of entry into observation. (The age distributions of the 5 rosters are shown in table 4.) Exclusion of the small number of men under 20 and 55 or over has no measurable effect on the results.

Tables 5, 6, and 7 show the number of deaths observed and the number expected, calculated as described above, in successive yearly intervals after the reference point, for each of the control groups C, WJ, and WE, respectively. In no case is the difference between observed and expected deaths statistically significant, and in the C's and WJ's the agreement is remark-

ably close. These comparisons demonstrate that the United States white male life table for 1949 is an unequivocally valid standard for evaluating the mortality experience of the ex-prisoners. Accordingly, the population life table, with its stable age-specific, annual mortalities, is employed as the standard of comparison against which to evaluate the mortality observations in the ex-prisoners. It will be observed that this agreement between the mortality experience of the controls in the period 1945-51 and the population life table of 1949 does not *necessarily* demonstrate that veteran mortality has been identical with that in the corresponding segment of the total population. On the contrary it indicates, if anything, a slightly more favorable mortality in veterans for the period in question. However, this matter is a subsidiary one in the study and has not been specifically examined in the detail it requires; e. g., with respect to the absolute mortality in white males without a service history. In addition, since the difference is probably slight, its detection would require a sample of veterans larger than the combined control groups of the study, and with the characteristics of the C group only.

TABLE 4

Distribution of Age at Reference Point; Five Rosters

| Age group | PWJ | WJ | PWE | WE | C |
|-----------------|-------|-------|-------|-------|-------|
| Number: | | | | | |
| Total..... | 1,850 | 1,075 | 1,804 | 998 | 1,964 |
| <20..... | 4 | ..... | 82 | 53 | 125 |
| 20-24..... | 444 | 225 | 904 | 403 | 620 |
| 25-29..... | 917 | 612 | 561 | 361 | 605 |
| 30-34..... | 280 | 172 | 188 | 126 | 316 |
| 35-39..... | 113 | 55 | 65 | 51 | 221 |
| 40-44..... | 35 | 11 | 4 | 4 | 54 |
| 45-49..... | 21 | ..... | ..... | ..... | 17 |
| 50-54..... | 20 | ..... | ..... | ..... | 4 |
| 55-59..... | 12 | ..... | ..... | ..... | 2 |
| 60-64..... | 4 | ..... | ..... | ..... | ..... |
| Percent: | | | | | |
| Total..... | 100.0 | 99.9 | 99.9 | 100.0 | 100.1 |
| <20..... | .2 | ..... | 4.5 | 5.3 | 6.4 |
| 20-24..... | 24.0 | 20.9 | 50.1 | 40.4 | 31.6 |
| 25-29..... | 49.6 | 56.9 | 31.1 | 36.2 | 30.8 |
| 30-34..... | 15.1 | 16.0 | 10.4 | 12.6 | 16.1 |
| 35-39..... | 6.1 | 5.1 | 3.6 | 5.1 | 11.3 |
| 40-44..... | 1.9 | 1.0 | .2 | .4 | 2.7 |
| 45-54..... | 2.2 | ..... | ..... | ..... | 1.1 |
| 55-64..... | .9 | ..... | ..... | ..... | .1 |

TABLE 5

Comparison of Annual Deaths After Reference Point in the General Controls (Group C) With Number Expected According to the 1949 Life Table for U. S. White Males, Ages 20-54

| Yearly interval after reference point | Number of deaths | | Yearly interval after reference point | Number of deaths | |
|---------------------------------------|------------------|----------|---------------------------------------|------------------|----------|
| | Observed | Expected | | Observed | Expected |
| 0-1..... | 4 | 3.9 | 4-5..... | 4 | 4.7 |
| 1-2..... | 4 | 4.1 | 5-6..... | 4 | 5.1 |
| 2-3..... | ..... | 4.3 | Total..... | 23 | 26.6 |
| 3-4..... | 7 | 4.5 | | | |

TABLE 6

Comparison of Annual Deaths After Reference Point in the Pacific Combat Controls (WJ) With Number Expected According to the 1949 Life Table for U. S. White Males, Ages 20-44

| Yearly interval after reference point | Number of deaths | | Yearly interval after reference point | Number of deaths | |
|---------------------------------------|------------------|----------|---------------------------------------|------------------|----------|
| | Observed | Expected | | Observed | Expected |
| 0-1..... | 3 | 2.0 | 4-5..... | 1 | 2.4 |
| 1-2..... | 2 | 2.1 | 5-6..... | 6 | 2.6 |
| 2-3..... | 1 | 2.2 | Total..... | 14 | 13.6 |
| 3-4..... | 1 | 2.3 | | | |

TABLE 7

Comparison of Annual Deaths After Reference Point in the European Combat Controls (WE) With Number Expected According to the 1949 Life Table for U. S. White Males, Ages 20-44

| Yearly interval after reference point | Number of deaths | | Yearly interval after reference point | Number of deaths | |
|---------------------------------------|------------------|----------|---------------------------------------|------------------|----------|
| | Observed | Expected | | Observed | Expected |
| 0-1..... | 1 | 1.8 | 4-5..... | 3 | 2.0 |
| 1-2..... | 1 | 1.8 | 5-6..... | 2 | 2.1 |
| 2-3..... | 5 | 1.9 | Total..... | 18 | 11.5 |
| 3-4..... | 6 | 1.9 | | | |

b. Mortality in the ex-prisoners after liberation

(1) The Pacific prisoners

The complete life table for the Pacific prisoners aged 20-54, in the first 6 years after liberation, is given in table 8. In the last two columns are shown the observed and expected net mortalities at the end of each successive year. These rates are presented graphically in figure 1. Observed and expected deaths by age are given in table 9.

It is clear from these data that the Pacific prisoners have experienced a marked excess of mortality following liberation, and that this excess is somewhat concentrated in the first 2 years. Annual death rates for successive 2-year periods are illustrated in figure 2. As compared with the mortality ratio of 2.2 for the 6 years (table 9), in the first 2 years, when there were 30 deaths as against 7.9 expected, the mortality ratio is 3.8. In the last 4 years, with 28 deaths observed and 18.1 expected, the mortality ratio drops to 1.5, although the difference between observed and expected deaths remains significant, but at a borderline level ($P=.035$). However, the later deaths include two killed in action in Korea during the sixth year.

This general picture of mortality in the Pacific prisoners suggests that some part of the extremely high death rate during imprisonment persisted at and shortly after liberation, then diminished rapidly within this first period of observation leaving an apparently persistent residual mortality excess at a much lower level.

TABLE 8

Life Table for Pacific Prisoners (PWJ) Alive at Liberation for First 6 Years Thereafter, Total Aged 20-54 at Liberation

| Yearly interval after reference point | Alive, beginning of interval | Died during interval | Mortality in interval 1,000 q_x | Survivors at beginning of interval per 1,000 alive at reference point l_x | Net mortality, end of interval | |
|---------------------------------------|------------------------------|----------------------|-----------------------------------|---|--------------------------------|-----------------------|
| | | | | | Observed 1,000 - l_{x+1} | Expected ¹ |
| 0-1..... | 1,830 | 21 | 11.48 | 1,000.0 | 11.48 | 2.11 |
| 1-2..... | 1,809 | 9 | 4.98 | 988.5 | 16.40 | 4.32 |
| 2-3..... | 1,800 | 9 | 5.00 | 983.6 | 21.32 | 6.60 |
| 3-4..... | 1,791 | 3 | 1.68 | 978.7 | 22.96 | 9.00 |
| 4-5..... | 1,788 | 5 | 2.80 | 977.0 | 25.70 | 11.53 |
| 5-6..... | 1,783 | 11 | 6.17 | 974.3 | 31.71 | 14.23 |
| 6-7..... | ..... | ..... | ..... | 968.3 | ..... | ..... |

¹ According to Life Table for U. S. White Males, 1949.

FIGURE 1

Cumulative Mortality in Successive Years After Reference Point, Pacific Prisoners (PWJ) and U. S. White Males, 1949.

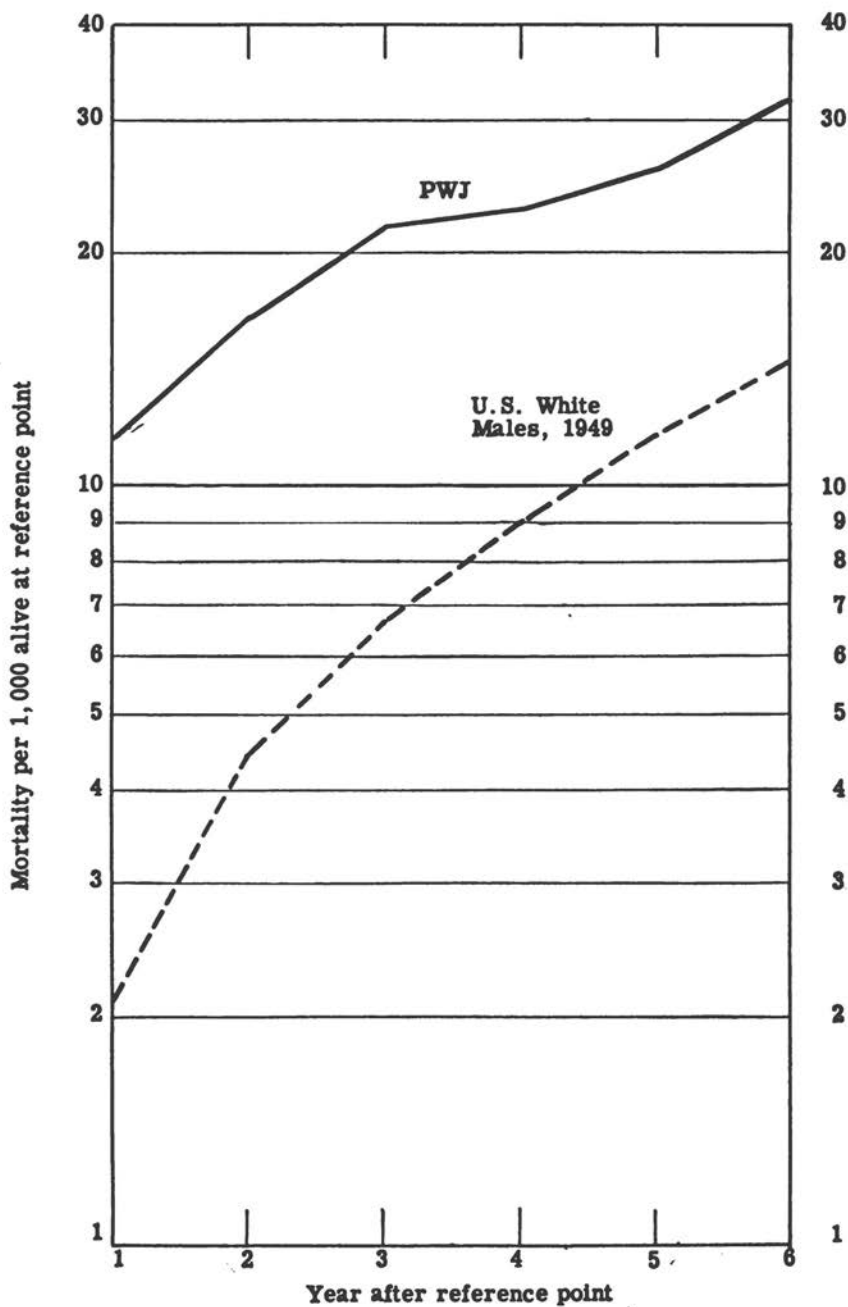


FIGURE 2

Annual Mortality in Successive 2-Year Intervals After Reference Point, Pacific Prisoners (PWJ). Expectations Based on 1949 Life Table for U. S. White Males.

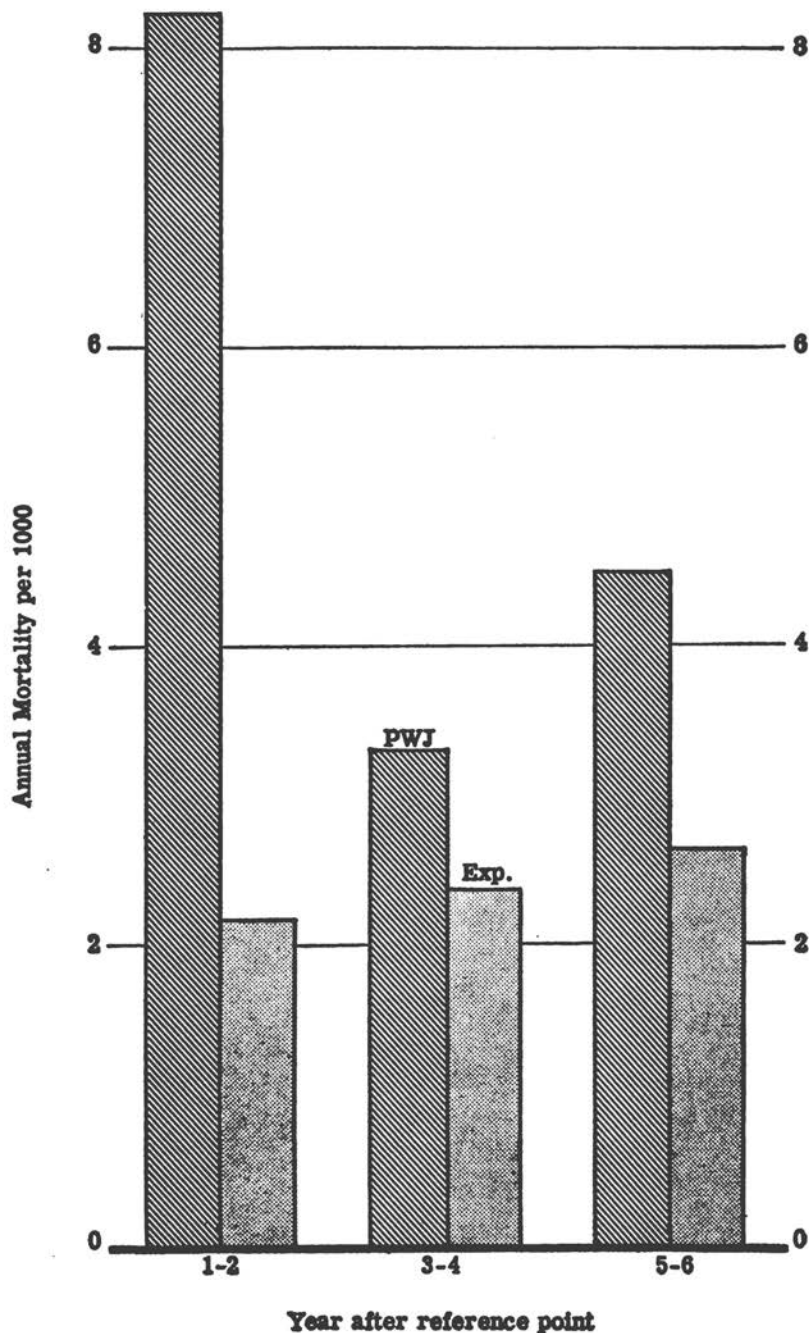


TABLE 9

Observed Deaths of Pacific Prisoners in First 6 Years of Observation, Compared With Deaths Expected on Basis of U. S. White Male Life Table of 1949, by Age

| Age | Number of men | Observed deaths | Expected deaths |
|---------------------------|---------------|-----------------|-----------------|
| 20-24..... | 444 | 14 | 4.6 |
| 25-29..... | 917 | 25 | 10.2 |
| 30-34..... | 280 | 9 | 4.3 |
| 35-39..... | 113 | 3 | 2.7 |
| 40-54..... | 76 | 7 | 4.3 |
| Total..... | 1,830 | 58 | 26.1 |
| Mortality ratio, O/E..... | | 2.22 | |

Cause of death

The foregoing findings concerning the early postliberation mortality in the Pacific prisoners focus attention on the causes of the deaths which account for the high death rate. The causes grouped in broad categories, their frequencies, and the number of deaths expected for each category among U. S. white males of equal number and age composition are given in table 10. These expected deaths were derived from the official reported numbers of registered deaths (4) by cause and age, expressed as rates based on the appropriate population segments, for the years 1946 and 1949, using the average of the rates for the 2 years. The average cause-specific rates so computed, when summed over all causes, give a total rate in close agreement with the 1949 life table mortality for the age groups involved, and for that reason were arbitrarily used for the comparisons in question.

For both pulmonary tuberculosis and accidental deaths the difference between the number observed and the number expected is highly significant. These 2 causes account for 64 percent of the deaths in the Pacific prisoners, and their excess over expectations is numerically a substantial portion of the total excess, sufficient in fact to account for all of its statistical significance.⁸

The high tuberculosis death rate is not unexpected, in the light of known facts about conditions in Japanese prison camps. As will be seen later, there were 18 cases of tuberculosis in the more intensively studied B group of the roster, which would indicate a possible total of about 68 cases in the roster as a whole. Assuming all cases arose during imprisonment, as they apparently did, the survivors alone had an approximate tuberculosis incidence of 36.6 per 1,000 in that period. As a point of comparison, Long and Jablon (5) have calculated a tuberculosis incidence rate of

⁸ For the total excess, $P < .000001$; without the excess of tuberculosis and accidental deaths, $P > .1$.

0.74 per 1,000 during World War II among white, male inductees with overseas service, and with not less than 25 months of total service. It is of course not known what the total incidence of tuberculosis was among the Pacific prisoners during imprisonment. Considering the very high death rate between capture and liberation, it is likely that total incidence was several times the rate exhibited by the survivors.

TABLE 10

Causes of Death in the Pacific Prisoners in the First 6 Years After Liberation

| Cause of death | Observed deaths | | Expected deaths ¹ |
|-----------------------------------|-----------------|---------|------------------------------|
| | Number | Percent | |
| Total..... | 58 | 100.0 | 25.3 |
| Cardiovascular..... | 8 | 13.8 | 4.1 |
| Pulmonary tuberculosis..... | 11 | 19.0 | 2.2 |
| Malignant neoplasm..... | 4 | 6.9 | 1.9 |
| Diseases of digestive system..... | 4 | 6.9 | 1.1 |
| Suicide..... | 3 | 5.2 | 1.5 |
| Accident..... | 26 | 44.8 | 10.1 |
| Battle ² | 2 | 3.4 | ³ 4.4 |

¹ Based on age- and cause-specific death rates, U. S. white males, 1946 and 1949. Source: NOVS, Vital Statistics of the U. S., 1946, 1949.

² Korean conflict.

³ Expected deaths for all causes other than those covered in the first 6 categories.

The conspicuous excess of accidental deaths indicates an area worth special study of a kind which is beyond the immediate scope of the present investigation. An effort was made to learn more about the men involved in the fatal accidents from VA claims folders, but those records contained relatively little pertinent information. All of the 26 accidental deaths occurred in men less than 35 years of age at liberation. Thirteen of the 26 accidental deaths occurred in service, but this fact appears to be immaterial as an explanation of the excess. As is true for total deaths, the greater part of the excess occurred in the first 2 years after liberation. In that period there were 16 deaths due to accidents as compared with 3.6 expected. Of the 16, 8 occurred before and 8 after separation. On a rate basis, with respect to service-years and veteran-years of exposure, respectively, the in-service accidental death rate on an annual basis is 14 per 1,000, whereas the postservice rate is 20 per 1,000, during the first 2 years. Within the first year after liberation alone, when there were 11 accidental deaths (6 in service and 5 after separation) as against 1.8 expected (a highly significant excess), the in-service rate is one-third of the postservice rate: 16 per 1,000 as compared with 49 per 1,000.

Automobile accidents accounted for 16 of the 26 accidental deaths, and airplane accidents for 4. Among the automobile accidents, some involved

pedestrians, some drivers, and some passengers. Alcohol played a part in several instances and in a few cases there were indications of psychiatric disorders. It is clear that for adequate understanding of how the experience of imprisonment is related to the high death rate from accidents, fairly full histories of the individuals are needed.

TABLE 11

Life Table for European Prisoners (PWE) Alive at Liberation, for First 6 Years Thereafter, Total Aged 20-44 at Liberation

| Yearly interval after reference point | Alive, beginning of interval | Died during interval | Mortality in interval 1,000 q_x | Survivors at beginning of interval, per 1,000 alive at reference point l_x | Net mortality, end of interval | |
|---------------------------------------|------------------------------|----------------------|-----------------------------------|--|--------------------------------|-----------------------|
| | | | | | Observed 1,000- l_{x+1} | Expected ¹ |
| 0-1 | 1,722 | 4 | 2.32 | 1,000.0 | 2.32 | 1.82 |
| 1-2 | 1,718 | 7 | 4.07 | 997.7 | 6.38 | 3.69 |
| 2-3 | 1,711 | 1 | .58 | 993.6 | 6.96 | 5.59 |
| 3-4 | 1,710 | 2 | 1.17 | 993.0 | 8.12 | 7.55 |
| 4-5 | 1,708 | 1 | .59 | 991.9 | 8.71 | 9.57 |
| 5-6 | 1,707 | 1 | .59 | 991.3 | 9.29 | 11.68 |
| 6-7 | | | | 990.7 | | |

¹ According to Life Table for U. S. White Males, 1949.

TABLE 12

Observed Deaths of European Prisoners in First 6 Years of Observation, Compared With Deaths Expected on Basis of U. S. White Male Life Table of 1949, by Age

| Age | Number of men | Observed deaths | Expected deaths |
|--------------------------------|---------------|-----------------|-----------------|
| 20-24 | 904 | 7 | 9.3 |
| 25-29 | 561 | 6 | 6.3 |
| 30-34 | 188 | 2 | 2.9 |
| 35-39 | 65 | 1 | 1.5 |
| 40-44 | 4 | | .1 |
| Total | 1,722 | 16 | 20.1 |
| Mortality ratio, O/E | | 0.80 | |

In the Pacific combat controls, there were 2 deaths from tuberculosis, as compared with 1.2 expected, and 6 deaths from accidents as against 5.8 expected, employing the same means of computing expectations as for the ex-prisoners. The remaining 6 deaths in this control group were distributed among that many separate cause categories.

TABLE 13

Causes of Death in the European Prisoners in the First 6 Years After Liberation

| Cause of death | Observed deaths | Expected deaths ¹ |
|-----------------------------------|-----------------|------------------------------|
| Total..... | 16 | 21.1 |
| Cardiovascular..... | 1 | 2.1 |
| Tuberculosis..... | 2 | 1.7 |
| Malignant neoplasm..... | ..... | 1.3 |
| Diseases of digestive system..... | 1 | .8 |
| Suicide..... | 2 | 1.3 |
| Accident..... | 8 | 10.3 |
| Other..... | ² 2 | 3.6 |

¹ Based on age- and cause-specific death rates, U. S. white males, 1946 and 1949. Source: NOVS, Vital Statistics of the U. S.

² Includes 1 unknown.

(2) *The European prisoners*

In the first 6 years after liberation, the European ex-prisoners experienced no excess of mortality whatever. The life table for this group is given in table 11, and the observed and expected deaths by age are shown in table 12. The deficiency of observed deaths is not statistically significant. The deaths by cause are given in table 13. In the PWE's, neither tuberculosis nor accidents are conspicuous causes of death, nor does any other cause appear with notable frequency.

4. AUTOPSY FINDINGS

For all of the deaths observed among both groups of prisoners, a search was made at the Armed Forces Institute of Pathology ⁴ for autopsy protocols. Out of a total of 83 deaths (including a few men 55 years of age and over and several whose deaths occurred more than 6 years after liberation), autopsy records were found for only 9, 7 Pacific prisoners and 2 European. In no case was the autopsy record informative as to findings indicative of possible residuals of the effects of imprisonment other than tuberculosis. For 2 men who had died of tuberculosis generalized lesions of the disease were described in the protocols.

The question arises whether more intensive post-mortem studies than these routine autopsies, for example of the gastrointestinal tract, the nervous system, and muscle tissue, might have revealed changes attributable to general malnutrition, specific nutritional deficiency, or other processes. The material available provides, of course, no answer.

⁴ Dr. Hans F. Smetana of the Institute made the search possible and kindly assisted in the review of the material found.

III. MORBIDITY AFTER LIBERATION

1. SOURCES AND COMPLETENESS OF INFORMATION

The extent and nature of illness and impairment exhibited by the prisoners after liberation were examined primarily by study of the frequency and causes of hospitalization in service and VA hospitals, in comparison with the controls. Information on service and VA hospitalization was obtained directly from Army records and from VA claims folders to which the bulk of Army clinical records had been transferred, and where records of VA hospitalizations are routinely filed. The facts from claims folders were supplied by VA regional offices on special forms devised for that purpose.

Evidence from earlier studies (2) has shown the value of the questionnaire for determining the completeness of such recorded information on hospitalizations, and for indicating the frequency of admissions to private and other nonfederally financed hospitals. In the present study, comparison of admissions to service and VA hospitals reported on the questionnaire with those obtained directly from service and VA records indicates that the latter are reported with a considerable degree of completeness. Case by case matching of particular admissions as reported by the 2 sources was carried out for a sample of cases, and this comparison indicated that at least 94 percent of service hospital admissions and about 84 percent of VA hospital admissions were obtained from official records by the methods employed. The examination of the admissions reported by the 2 sources suggested, furthermore, that these estimates may be low. The estimates depend, of course, on admissions reported on the questionnaire which were not found in records, and it appeared in some cases that the respondents had reported a series of outpatient visits as a hospitalization, whereas outpatient admissions were not obtained from records.

The questionnaires indicated that 5 percent of the Pacific prisoners and 8 percent of the European prisoners were admitted to private or other non-service and non-VA hospitals, in the period from liberation to the end of 1951.

2. SERVICE HOSPITALIZATION (SH) AND VA HOSPITALIZATION (VAH) AS RECORDED IN ARMY AND VA RECORDS

a. Total SH and VAH admissions in the 6 years after liberation

Comparison of the hospitalization experience of the prisoner groups and their combat controls is confined to the information available from Army

and VA records of hospital admissions. In table 14 are shown the total admission rates for each type of hospital in the 4 groups during the 6 years after the reference point. The rates are based on the appropriate exposures obtained by summing separately months of service and months as a veteran. The difference in SH and VAH admission rates reflects in large part the relatively unrestricted medical care policy of the services. The generally recognized magnitude of this difference is illustrated by the SH and VAH admission rates for the control groups.

In SH admissions, the Pacific prisoners appreciably exceed the European prisoners, and each prisoner group exceeds its controls. At a much lower level, this is true also in VAH admissions, except for European prisoners in relation to their controls. This general summary of the postliberation morbidity differentials observed, in addition to providing an orientation for the more detailed analysis as to time relations, diagnoses, etc., to be described, also furnishes a basis for the following evaluation of the relation to morbidity after liberation of certain characteristics of the rosters and factors related to imprisonment. The more important of these are the composition of the rosters with respect to component and age, deviation from average body weight at induction, medical condition at capture, stress and weight loss during imprisonment, and, for the controls, morbidity during the period of combat equivalent to the prisoners' period of imprisonment.

TABLE 14

Hospitalization After Liberation: Admissions Per 100 Men Per Year During First 6 Years After Reference Point, by Type of Hospital

| Group | Service hospitals | | | VA hospitals | | |
|----------|----------------------|----------------------|------------------------------|----------------------|----------------------|------------------------------|
| | Number of admissions | Man-years in service | Admissions per 100 man-years | Number of admissions | Man-years as veteran | Admissions per 100 man-years |
| PWJ..... | 891 | 1, 158. 1 | 76. 9 | 176 | 1, 724. 4 | 10. 2 |
| WJ..... | 117 | 290. 0 | 40. 3 | 95 | 2, 827. 1 | 3. 4 |
| PWE..... | 248 | 464. 9 | 53. 3 | 50 | 2, 300. 6 | 2. 2 |
| WE..... | 128 | 401. 6 | 31. 9 | 44 | 2, 339. 5 | 1. 9 |

Interest in the two factors component and age lies in the fact that the Pacific prisoners differ significantly from both their controls and the European prisoners with respect to each. As between the two factors these differences are not interrelated: the age differences persist in both Regular Army men and inductees. The relation of postliberation hospitalization to component is shown in table 15, and to age in table 16. It is evident that neither factor plays a role in the group-differences in hospitalization rates. Of the component-specific rates (table 15), the only instance in

which the distribution by component is significantly different from the total rate of table 14 is in the SH admissions of the PWJ's. Of the age-specific rates (table 16), those of the PWJ's SH admissions decrease significantly with increasing age. The implications of these relations are not understood.

With respect to the factor of deviation from standard weight at entry in relation to postliberation hospitalization, except for one isolated detail, no association was found. Among the European prisoners, the small group whose body weight on entering service was 15 percent or more under the median weight for height of Army men had a VAH admission rate of 14 per 100 men per year, more than 6 times the rate for any other weight class in the group.

TABLE 15

Hospitalization After Liberation, by Component, by Type of Hospital: Admissions Per 100 Men Per Year, Each Group

| Group | Service hospitals | | | VA hospitals | | |
|----------|-------------------|----------------|-----------|--------------|----------------|-----------|
| | Regular Army | National Guard | Inductees | Regular Army | National Guard | Inductees |
| PWJ..... | 71.8 | 111.3 | 92.5 | 10.4 | 13.1 | 8.4 |
| WJ..... | 42.0 | 41.9 | 36.6 | 3.8 | 3.5 | 3.0 |
| PWE..... | 51.1 | 80.0 | 53.5 | 3.1 | 2.4 | 2.0 |
| WE..... | 24.5 | 32.8 | 33.6 | 1.2 | 1.9 | 2.0 |

TABLE 16

Hospitalization After Liberation, by Age, by Type of Hospital: Admissions Per 100 Men Per Year, Each Group

| Group | Service hospitals | | | | VA hospitals | | | |
|----------|-------------------|-------|-------|------|--------------|-------|-------|-----|
| | <25 | 25-29 | 30-34 | ≥35 | <25 | 25-29 | 30-34 | ≥35 |
| PWJ..... | 85.7 | 81.7 | 69.2 | 57.0 | 7.4 | 11.6 | 10.5 | 9.7 |
| WJ..... | 52.7 | 39.6 | 44.0 | 6.6 | 4.9 | 3.1 | 3.3 | .8 |
| PWE..... | 56.5 | 54.1 | 37.8 | 41.4 | 1.4 | 2.4 | 5.0 | 3.9 |
| WE..... | 34.5 | 29.2 | 26.6 | 36.6 | 1.5 | 2.1 | 2.9 | 1.3 |

With respect to factors more directly related to imprisonment, only the information from the questionnaires is sufficiently full to be useful in these comparisons. The relations of physical condition at capture to postliberation hospitalization are shown in table 17. Of the two groups, the European prisoners had a higher proportion of men too ill to walk when captured, and in that group there is a marked association between condition at capture and postliberation hospitalization, both SH and VAH. The indication of such an association in the PWJ's with respect to SH admissions is not

significant. It is apparent, however, that this diversity between the two groups plays little part in accounting for their difference in postliberation hospitalization, although the PWE's who were sickest at capture show a rate exceeding that of the PWJ's who were well at capture. This observation of a more or less *à priori* expectation tends to substantiate the validity of the questionnaire statement on physical condition at capture.

The number of different types of stress¹ experienced during imprisonment, as checked off by the men on their questionnaires, is the only specific measure of the general magnitude of stress it has been possible to obtain. The Pacific prisoners reported an average of 6.1 types of stressful experience, the European 3.8 types. The distributions of number of stress items, and of hospital admission rates by number of items, are shown in table 18. The apparent association between postliberation hospitalization and this measure of stress during imprisonment is significant only in one instance, that of VAH admissions in the PWJ's. Nevertheless the roster difference in hospitalization is preserved, insofar as these data can show, independently of the variation in degrees of stress.

TABLE 17

Hospitalization After Liberation, by Physical Condition at Capture as Reported on the Questionnaire: Each Prisoner Group

| Group | Condition at capture | Men reporting | | Admission rate | |
|----------|----------------------------|---------------|---------|----------------|-------|
| | | Number | Percent | SH | VAH |
| PWJ..... | Not SIW ¹ | 223 | 52.7 | 69.7 | 8.8 |
| | SIW, ambulatory..... | 177 | 41.8 | 82.4 | 11.4 |
| | SIW, not ambulatory..... | 23 | 5.4 | 86.8 | 5.9 |
| | Total..... | 423 | 99.9 | ..... | ..... |
| PWE..... | Not SIW..... | 219 | 52.3 | 43.9 | 1.3 |
| | SIW, ambulatory..... | 143 | 34.1 | 49.7 | 2.5 |
| | SIW, not ambulatory..... | 57 | 13.6 | 76.9 | 5.1 |
| | Total..... | 419 | 100.0 | ..... | ..... |

¹ Sick, injured, or wounded.

On the basis of questionnaire statements about loss of weight during imprisonment, the Pacific prisoners lost on the average 61 pounds, the European prisoners 38. However, this difference is not significantly associated with postliberation hospitalization.

For combat controls, the hospitalization rate after the end of hostilities bears no significant relation to their admission rate in the preceding period of combat which corresponds to the period of imprisonment for the prisoners.

² These are described in section V.

b. Annual hospitalization rates after liberation

(1) Annual admission rates

The number of hospital admissions per hundred man-years, during each year after liberation, is shown for the Pacific prisoners and their controls in tables 19 and 20 (SH and VAH admissions respectively) and for the European prisoners and their controls in tables 21 and 22. The trends of these rates are presented graphically in figures 3 and 4. The tables and graphs show the conspicuously high rates of SH admissions in the first year for the two prisoner groups. Such admissions were appreciably more

TABLE 18

Hospitalization After Liberation, by Number of Types of Stress Experienced During Imprisonment as Reported on Questionnaire: Each Prisoner Group

| Group | Number of Stress Items | Men Reporting | | Admission rate | |
|------------|------------------------|---------------|---------|----------------|-------|
| | | Number | Percent | SH | VAH |
| PWJ..... | <3 | 7 | 1.6 | 51.9 | 3.5 |
| | 3-4 | 51 | 12.0 | 58.8 | 7.1 |
| | 5-6 | 191 | 44.9 | 78.8 | 8.8 |
| | ≥7 | 176 | 41.4 | 79.7 | 11.7 |
| Total..... | | 425 | 99.9 | | |
| PWE..... | <3 | 89 | 21.2 | 36.3 | 2.0 |
| | 3-4 | 193 | 46.1 | 48.9 | 1.6 |
| | 5-6 | 119 | 28.4 | 63.6 | 3.8 |
| | ≥7 | 18 | 4.3 | 65.9 | ..... |
| Total..... | | 419 | 100.0 | | |

TABLE 19

Annual Admission Rates to Service Hospitals, Pacific Prisoners and Pacific Combat Controls

| Year after liberation... | 1 | 2 | 3 | 4 | 5 | 6 | 2-6 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| PWJ | | | | | | | |
| Man-years of service..... | 386.9 | 181.8 | 166.7 | 154.9 | 140.8 | 127.0 | 771.2 |
| SH admissions..... | 605 | 91 | 56 | 65 | 47 | 27 | 286 |
| Admissions per 100 man-years..... | 156.4 | 50.1 | 33.6 | 42.0 | 33.4 | 21.3 | 37.1 |
| WJ | | | | | | | |
| Man-years of service..... | 71.7 | 43.3 | 41.1 | 44.5 | 43.2 | 46.3 | 218.3 |
| SH admissions..... | 35 | 27 | 8 | 19 | 17 | 11 | 82 |
| Admissions per 100 man-years..... | 48.8 | 62.3 | 19.5 | 42.7 | 39.4 | 23.8 | 37.6 |

frequent in the Pacific prisoners than in the European, the SH first year admission rate of the former being twice that of the latter (cf. tables 19 and 21). Similarly, so far as SH admissions are concerned, only in the first year is either prisoner group different from its control. In a sense this difference is an approximate measure of the frequency of hospitalization undertaken expressly to determine the effects of imprisonment. In the PWJ's the difference is roughly 1 admission per man, and in the PWE's about 0.4 admission per man. In the years subsequent to the first, the SH admission rates of both prisoner groups are very similar to the rates of their controls.

TABLE 20

Annual Admission Rates to VA Hospitals, Pacific Prisoners and Pacific Combat Controls

| Year after liberation . . . | 1 | 2 | 3 | 4 | 5 | 6 | 2-6 |
|--|-------|-------|-------|-------|-------|-------|---------|
| PWJ | | | | | | | |
| Man-years as veteran | 101.7 | 302.2 | 314.4 | 323.8 | 335.4 | 347.0 | 1,622.8 |
| VAH admissions | 10 | 28 | 38 | 37 | 40 | 23 | 166 |
| Admissions per 100 man-years | 9.8 | 9.3 | 12.1 | 11.4 | 11.9 | 6.6 | 10.2 |
| WJ | | | | | | | |
| Man-years as veteran | 449.3 | 477.6 | 478.9 | 474.8 | 475.3 | 471.2 | 2,377.8 |
| VAH admissions | 32 | 11 | 8 | 15 | 15 | 14 | 63 |
| Admissions per 100 man-years | 7.1 | 2.3 | 1.7 | 3.2 | 3.2 | 3.0 | 2.6 |

TABLE 21

Annual Admission Rates to Service Hospitals, European Prisoners and European Combat Controls

| Year after liberation . . . | 1 | 2 | 3 | 4 | 5 | 6 | 2-6 |
|--|-------|------|------|------|------|------|-------|
| PWE | | | | | | | |
| Man-years of service | 261.9 | 47.4 | 36.2 | 40.8 | 41.4 | 37.2 | 203.0 |
| SH admissions | 196 | 17 | 10 | 12 | 7 | 6 | 52 |
| Admissions per 100 man-years | 74.8 | 35.9 | 27.6 | 29.4 | 16.9 | 16.1 | 25.6 |
| WE | | | | | | | |
| Man-years of service | 219.5 | 41.3 | 34.3 | 35.6 | 34.3 | 36.7 | 182.1 |
| SH admissions | 74 | 15 | 10 | 13 | 9 | 7 | 54 |
| Admissions per 100 man-years | 33.7 | 36.4 | 29.1 | 36.5 | 26.3 | 19.1 | 29.7 |

TABLE 22

*Annual Admission Rates to VA Hospitals, European Prisoners and
European Combat Controls*

| Year after liberation . . . | 1 | 2 | 3 | 4 | 5 | 6 | 2-6 |
|--|-------|-------|-------|-------|-------|-------|---------|
| PWE | | | | | | | |
| Man-years as veteran | 199.1 | 413.6 | 424.8 | 420.2 | 419.6 | 423.3 | 2,101.5 |
| VAH admissions | 2 | 8 | 14 | 6 | 9 | 11 | 48 |
| Admissions per 100 man-years | 1.0 | 1.9 | 3.3 | 1.4 | 2.1 | 2.6 | 2.3 |
| WE | | | | | | | |
| Man-years as veteran | 241.5 | 419.8 | 424.5 | 419.3 | 418.8 | 415.7 | 2,098.0 |
| VAH admissions | 5 | 12 | 8 | 11 | 4 | 4 | 39 |
| Admissions per 100 man-years | 2.1 | 2.9 | 1.9 | 2.6 | 1.0 | 1.0 | 1.9 |

With respect to VAH admission rates (table 20), the PWJ's are consistently higher than either their controls or the PWE's (cf. table 22). In the PWJ-WJ comparison this difference is appreciable in the second, third, fourth, and fifth years. In that period as a whole the annual PWJ admission rate of 11.2 per 100 man-years is 4.3 times the WJ rate of 2.6. This diversity is the major observation of the gross postliberation morbidity picture. The annual VAH admission rates for the European prisoners and their controls are indistinguishable. The parallelism of these general morbidity findings with those in mortality is clear.

(2) *Percent of days spent in hospital, by year*

This index provides another measure of morbidity, one that takes into account an aspect of severity of illness. The index is subject to certain limitations as to meaning, in that the days in hospital attributed to a group bears no systematic relation to the proportion of men in the group who are hospitalized. However, the index has a certain usefulness, and the validity of comparisons can be examined by reference to the number of men whose hospital experience the index represents. The examination of this factor will be confined to the observation of postliberation hospitalization which is of primary interest—the VAH experience of Pacific prisoners.

Table 23 and the solid lines of figure 5 show, for each year after liberation, the percentage of total veteran-days spent in VA hospitals for the Pacific prisoners and their controls. In the first year the hospital days of the controls exceed those of the prisoners (as do the number of men hospitalized, but not in the same ratio). In view of the immediate and sharp reversal of this relation in the second year, and the very high SH admission rate of the PWJ's in the preceding portion of the first year, it may be assumed that service hospitalization absorbed a considerable portion of that group's first-year medical care needs.

FIGURE 3

Annual Admission Rates to Service and VA Hospitals, Pacific Prisoners and Controls

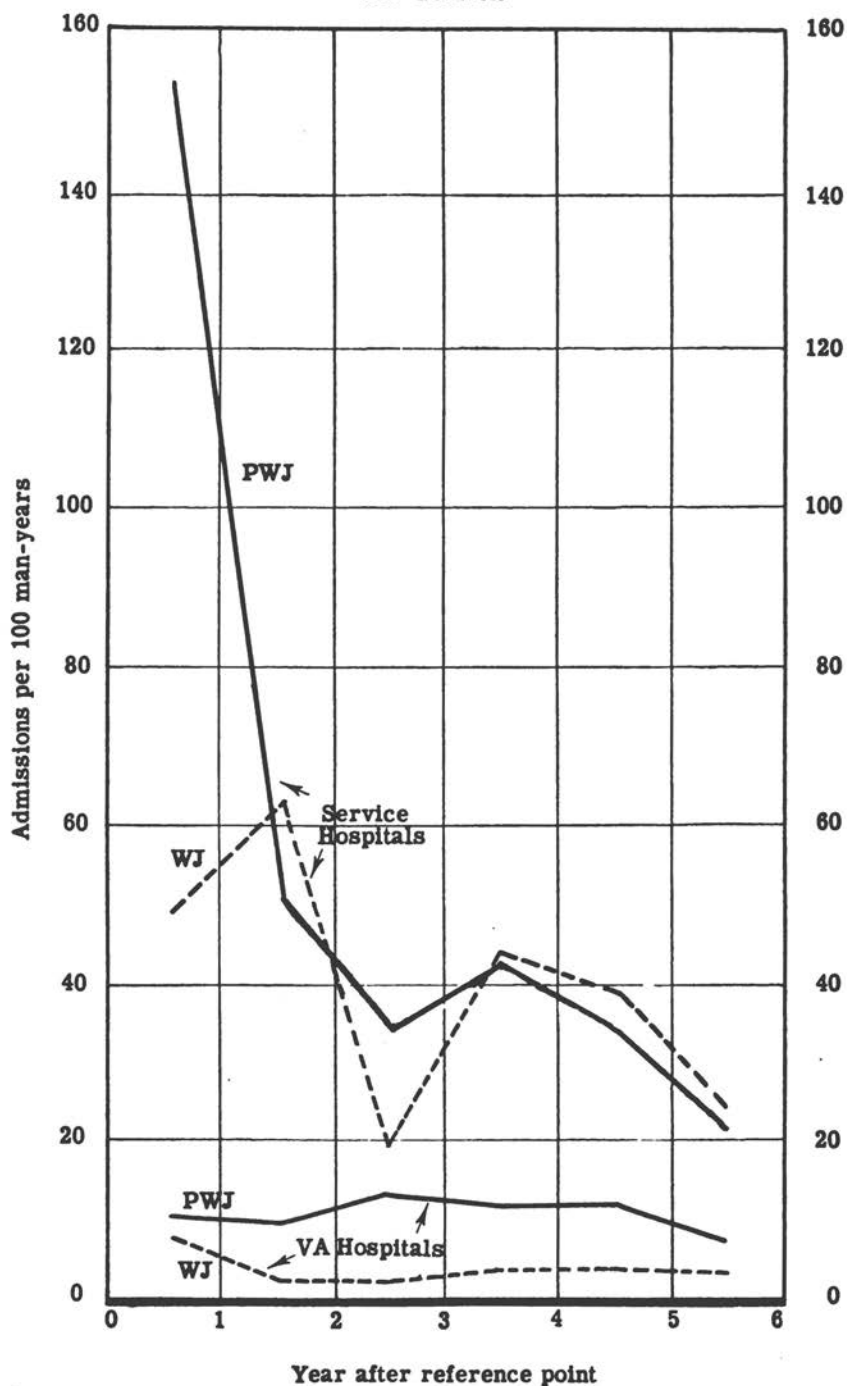
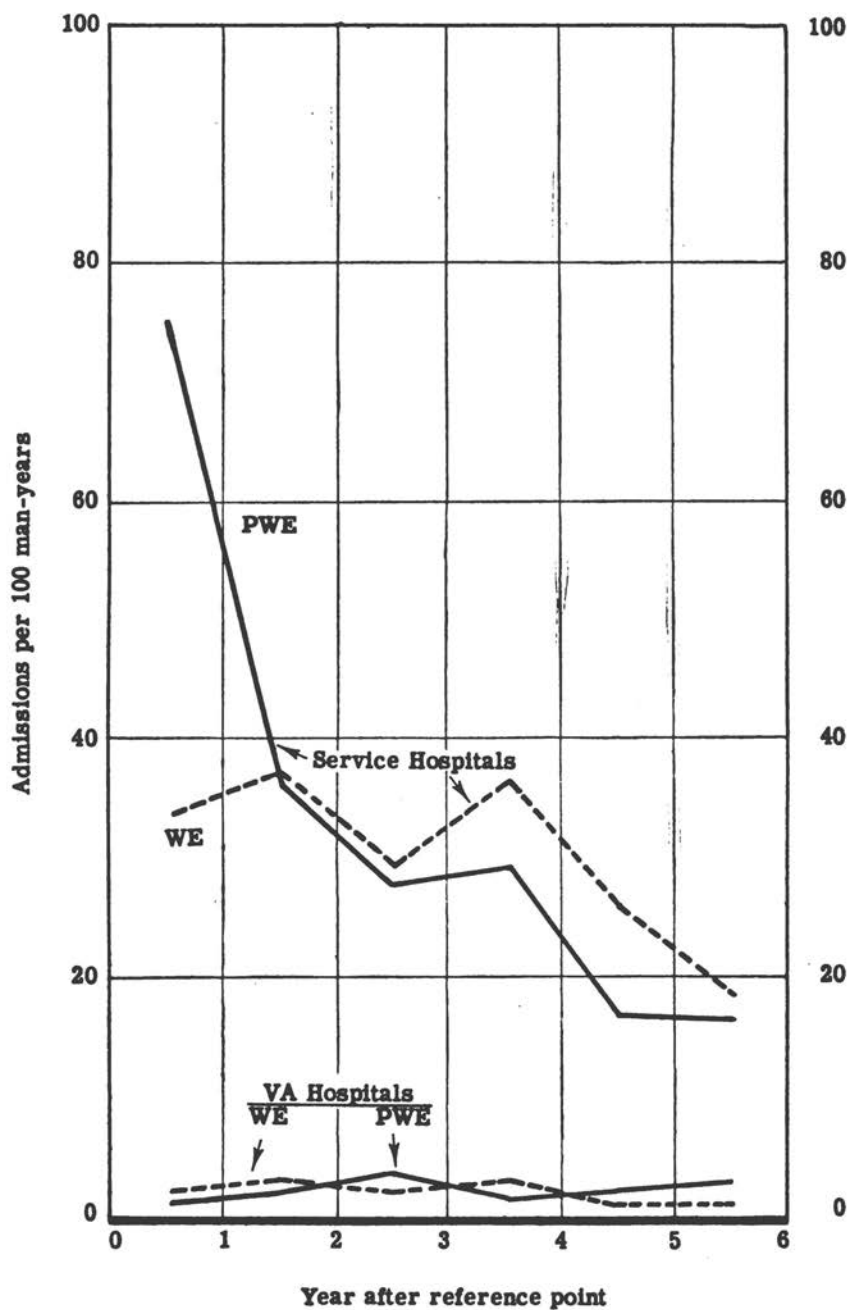


FIGURE 4

Annual Admission Rates to Service and VA Hospitals, European Prisoners and Controls



After the first year, the VA hospital-days rate of the PWJ's is greatly in excess of that of the WJ's. This difference is roughly reflected in the number of men hospitalized in the two groups. However, the hospital experience of the men who were hospitalized is not consistently in agreement with these relations. In the fourth and fifth year, the average number of days in hospital for hospitalized men is for the WJ's appreciably in excess of the corresponding average in the PWJ's.

TABLE 23

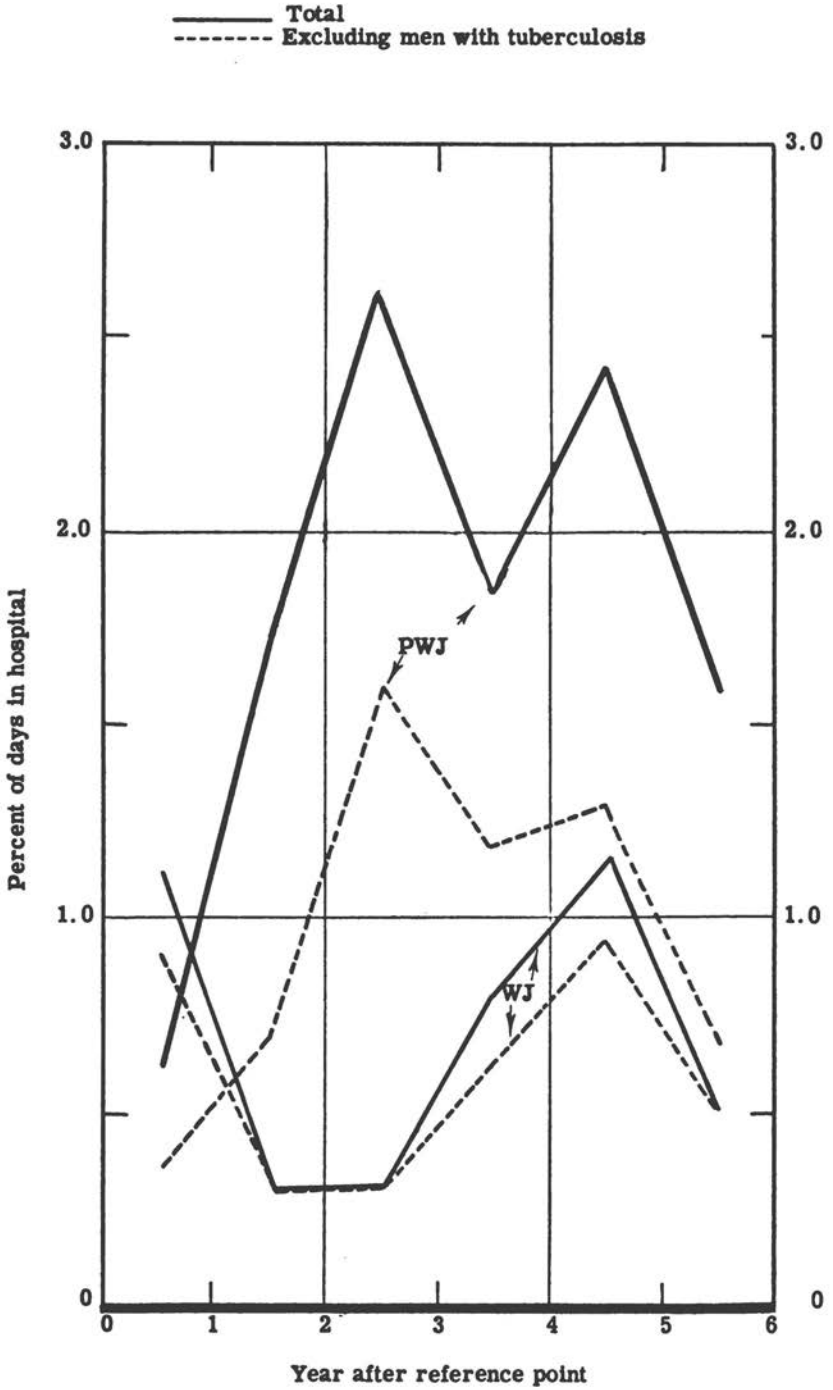
Percent of Veteran-Days Spent in VA Hospitals, by Year After Liberation, Pacific Prisoners and Controls

| Year after liberation | 1 | 2 | 3 | 4 | 5 | 6 |
|---|-------|-------|-------|-------|-------|-------|
| PWJ | | | | | | |
| Number of veteran-days (thousands) | 36.6 | 108.8 | 113.2 | 116.6 | 120.7 | 124.9 |
| Number of men hospitalized | 10 | 26 | 37 | 38 | 41 | 27 |
| Number of days in VA hospitals | 225 | 1,862 | 2,960 | 2,161 | 2,936 | 1,957 |
| Hospital-days per 100 veteran-days | 0.61 | 1.71 | 2.62 | 1.85 | 2.43 | 1.57 |
| Hospital-days per man hospitalized | 22.5 | 71.6 | 80.0 | 56.9 | 71.6 | 72.5 |
| WJ | | | | | | |
| Number of veteran-days (thousands) | 161.8 | 171.9 | 172.4 | 170.9 | 171.1 | 169.6 |
| Number of men hospitalized | 30 | 12 | 10 | 15 | 16 | 14 |
| Number of days in VA hospitals | 1,774 | 508 | 539 | 1,384 | 1,983 | 859 |
| Hospital-days per 100 veteran-days | 1.10 | 0.29 | 0.31 | 0.81 | 1.16 | 0.51 |
| Hospital-days per man hospitalized | 59.1 | 42.3 | 53.9 | 92.3 | 123.9 | 61.4 |

It is clear that these details will be found to have an intrinsic relation to the causes of hospitalization. While an exhaustive analysis of diagnoses does not seem warranted in this particular context, the difference in frequency of tuberculosis in the two groups, in the light of the long durations of tuberculosis hospitalizations, focuses attention on the role of that disease in the magnitude and trend of the hospital-days rates. Table 24 presents data parallel to those of table 23, with the exception that the 18 men with tuberculosis in the PWJ's, and the 4 such men in the WJ's are omitted, both as to days in hospital and exposure. The trends of the hospital-days rates of table 24 are shown by the dotted lines in figure 5. The level of the rate is approximately halved in the PWJ's when the tuberculous prisoners are left out, but in the WJ's, while the rate is decreased somewhat, the overall change is not great. Furthermore, after the third year the difference in rate between the two groups is very much reduced. On the other hand the general relations between the two groups, with respect to average days in hospital for men hospitalized, are not changed (except for magnitude) when tuberculosis admissions are omitted. Longer average stays in the

FIGURE 5

VA Hospital-Days Per 100 Veteran-Days, Pacific Prisoners and Controls



WJs than in the PWJs are still found in the fourth and fifth years and now appear also in the sixth year, suggesting the possibility of a continuing trend.

TABLE 24

Percent of Veteran-Days Spent in VA Hospitals, Excluding Men With Tuberculosis, by Year After Liberation, Pacific Prisoners and Controls

| Year after liberation | 1 | 2 | 3 | 4 | 5 | 6 |
|--|-------|-------|-------|-------|-------|-------|
| PWJ | | | | | | |
| Number of veteran days (thousands) | 35.8 | 104.3 | 108.1 | 111.6 | 116.2 | 120.2 |
| Number of men hospitalized | 8 | 19 | 31 | 31 | 32 | 21 |
| Number of days in VA hospital | 131 | 719 | 1,798 | 1,331 | 1,465 | 793 |
| Hospital-days per 100 veteran-days | 0.37 | 0.69 | 1.66 | 1.19 | 1.26 | 0.66 |
| Hospital-days per man hospitalized | 16.4 | 37.8 | 58.0 | 42.9 | 45.8 | 37.8 |
| WJ | | | | | | |
| Number of veteran-days (thousands) | 160.7 | 170.7 | 171.3 | 169.9 | 170.0 | 168.5 |
| Number of men hospitalized | 28 | 11 | 10 | 14 | 15 | 13 |
| Number of days in VA hospital | 1,423 | 501 | 539 | 1,029 | 1,618 | 835 |
| Hospital-days per 100 veteran-days | 0.89 | 0.29 | 0.31 | 0.61 | 0.95 | 0.50 |
| Hospital-days per man hospitalized | 50.8 | 45.5 | 53.9 | 73.5 | 107.9 | 64.2 |

c. Diagnoses in the 6 years after liberation

The actual illnesses and impairments exhibited by prisoners after liberation are indicated by the diagnoses received in service and VA hospitals during the first 6 years after liberation. As was seen in the preceding discussion of annual morbidity trends, the hospital admissions occurring in the whole observation period are, for the ex-prisoners, somewhat concentrated in the first year. The illnesses, however, are frequently chronic, and often of a kind that tend to persist in some degree after hospital discharge and to appear again in subsequent admissions. Accordingly, for this initial broad view of types of conditions manifested after liberation, a particular diagnostic category is counted only once for an individual even though he may have received a diagnosis in that category in two or more admissions during the observation period.

The diagnoses reported have been grouped into 36 categories of illness and impairment, largely in accordance with the 1949 International Statistical Classification of Diseases, Injuries, and Causes of Death. These categories and the number of men classified in each, by roster, are set forth in table 25, which shows also the International List codes by which each category is defined. This somewhat coarse grouping is of considerable practical value for a first exploration of the full range of types of illness. Any category which appears to be of interest can of course be readily broken down into specific diagnoses.

TABLE 25

Disease and Impairment Categories in Which Hospital Diagnoses Received After Liberation Are Classified, and Number of Men in Each Category, by Roster

| Diagnostic category | International List Code (1949) | PWJ | WJ | PWE | WE |
|--|---|-------|------|------|------|
| Tuberculosis, all forms | 001-019 | 18 | 4 | 3 | 5 |
| Syphilis | 020-029 | 14 | 3 | 3 | 4 |
| Veneral disease other than syphilis | 030-039 | 11 | 3 | 3 | 4 |
| Dysentery | 045-048 | 42 | 2 | 1 | 1 |
| Malaria | 110-117 | 21 | 27 | 1 | 6 |
| Helminthous disease | 123-130 | 151 | 1 | 1 | 1 |
| Other infective and parasitic diseases | 040-138, other than above | 49 | 13 | 22 | 15 |
| Neoplasm, malignant | 140-205 | 3 | 1 | 1 | 1 |
| Neoplasm, benign and unspecified | 210-239 | 12 | 1 | 4 | 2 |
| Beriberi | 280 | 40 | 1 | 1 | 1 |
| Malnutrition, unspecified | 286.5 | 296 | 1 | 44 | 1 |
| Other nutritional deficiency | 280-286.6, other than above | 18 | 1 | 2 | 1 |
| Eye condition, due to nutritional deficiency | 370-389 | 15 | 1 | 1 | 1 |
| Psychosis | 300-309 | 11 | 10 | 3 | 4 |
| Psychoneurosis, and other NP condition | 310-326 | 75 | 14 | 33 | 8 |
| Refractive error of eye | 380 | 34 | 1 | 2 | 1 |
| Other eye condition, not due to nutritional deficiency | 370-389, except 380 | 16 | 3 | 8 | 3 |
| Deafness | 397-398 | 15 | 1 | 1 | 1 |
| Other ear condition | 390-396 | 16 | 5 | 3 | 1 |
| Rheumatic fever, heart disease, hypertension, and arteriosclerosis | 400-450 | 20 | 4 | 4 | 1 |
| Varicose veins | 460-462 | 21 | 5 | 6 | 5 |
| Other disease of arteries and veins, and disease of lymphatic system | 451-456, 463-468 | 6 | 1 | 2 | 1 |
| Pneumonia | 480, 490-493 | 7 | 4 | 3 | 1 |
| Other respiratory diseases | 470-527, other than above | 85 | 27 | 39 | 26 |
| Diseases of oral cavity | 530-539 | 30 | 4 | 7 | 3 |
| Peptic ulcer | 540-542 | 7 | 3 | 5 | 1 |
| Gastritis, enteritis, and functional intestinal disorders | 543-545, 571-573 | 28 | 4 | 23 | 1 |
| Hernia | 560-561 | 15 | 2 | 3 | 4 |
| Diseases of liver, gallbladder, and pancreas | 580-587 | 6 | 2 | 1 | 1 |
| Gastrointestinal symptoms | 784-785 | 4 | 1 | 1 | 1 |
| Other diseases of digestive system | 530-587, other than above | 14 | 4 | 3 | 2 |
| Genitourinary diseases, non-VD | 590-617, except 615 | 32 | 7 | 9 | 14 |
| Diseases of skin and cellular tissue | 620-621, 690-716 | 66 | 16 | 22 | 18 |
| Diseases of bones and organs of movement | 720-749 | 42 | 10 | 16 | 8 |
| Wounds or injuries, including residuals, and treatment for | E and N series | 97 | 21 | 73 | 23 |
| Other conditions | All codes not specified above | 81 | 7 | 23 | 11 |
| Total number of categories | | 1,418 | 209 | 373 | 168 |
| Number of men | | 492 | 521 | 462 | 461 |
| Number of categories per man | | 2.88 | 0.40 | 0.81 | 0.36 |

Certain artificial aspects of these data need to be recognized. Since some of the categories are broad and cover a number of specific diagnoses, and, as pointed out, a man who has received several such diagnoses will be counted only once in the category, in that respect the frequencies may understate the extent of his illness or impairment. Conversely a man who receives diagnoses falling in two or more categories will be represented that number of times, so that broad intergroup comparisons; e. g., with respect to the total number of categories, will not reflect the nature of combinations of categories per man in each group, or differences in chronicity, severity, amenability to treatment, etc.

In the interpretation of these comparisons with respect to the nature and frequency of kinds of illness, account must be taken of the fact that 95 percent of the Pacific prisoners were hospitalized for screening shortly after liberation. Awareness of conditions in Japanese prison camps and concern about their consequences resulted in an effort to hospitalize as many of the Pacific ex-prisoners as possible, whereas the European ex-prisoners were, like nonprisoners returning from combat, examined by medical officers, and hospitalized if their condition required it. In the sample of European prisoners, 36 percent entered service hospitals after liberation. However, the possibility that this difference in handling accounts for an important part of the difference in postliberation morbidity between the two groups requires the assumption that for many European prisoners with tuberculosis, dysentery, helminthous diseases, malnutrition, cardiovascular diseases, etc., these conditions escaped attention during the period before they were separated. Not only is this extremely unlikely in the Army's medical care system, but some independent evidence is at hand which supports the contrary assumption.

A comparison of types and frequencies of diagnoses was made between those Pacific and European prisoners who had just one service hospital admission in the first year after liberation, on the assumption that if only the difference in hospitalization accounted for their dissimilarity in kind and amount of illness, this dissimilarity should not appear in men with equal hospital experience. There were 360 Pacific and 140 European prisoners with one and only one SH admission in the first year after liberation. In the 6 years of observation, in both service and VA hospitals, the former group received 974 diagnoses, or 2.7 per man, the latter group received 249 diagnoses, or 1.8 per man. More specifically, looking only at the major illness categories² which characterize the principal postliberation morbidity residuals of the Pacific group, and of these only the ones diagnosed in the first year after liberation, the Pacific prisoners with just one SH admission received 399 such diagnoses, or 1.1 per man, whereas the European prisoners with one SH admission received 38 such diagnoses, or 0.27 per man.

² Tuberculosis, dysentery, malaria, helminthous diseases, nutritional deficiency, and cardiovascular disease.

Further evidence is found in the hospital admission rates observed after the first year following liberation. In the total 5-year period covering years 2 through 6, when routine hospitalization for screening purposes was no longer the practice, annual admission rates to service and VA hospitals among PWJ's and PWE's, and, for comparison with the latter, among WE's, were as follows: ³

| | SH | VAH |
|----------|------|------|
| PWJ..... | 37.1 | 10.2 |
| PWE..... | 25.6 | 2.3 |
| WE..... | 29.7 | 1.9 |

For both types of admission, the difference between PWJ's and PWE's is quite significant ($P < .01$), whereas in neither case is the difference between PWE's and WE's significant.

These observations support the validity of the morbidity differences between PWJ's and PWE's in the first year after liberation, suggest that no appreciable amount of serious illness was missed in the European prisoners who were not hospitalized at or shortly after liberation, and indicate that the difference between the Pacific and European groups in proportion of men hospitalized shortly after liberation is not an important factor in accounting for their differences in the kind and amount of illness they exhibited.

The data of table 25 may be taken to provide a broad measure of the comparative amount and kinds of illness in the various rosters. The summary figures on number of categories per man indicate seven times as much illness in the Pacific prisoners as in their controls; more than twice as much in the European prisoners as in their controls; about three and one-half times as much in the Pacific prisoners as in the European prisoners; and approximately the same amount in the two control groups.

Of special interest are the frequencies for the individual categories. The number of men in the four rosters is similar enough to permit comparisons of the frequencies without resorting to percentages. The excess of syphilis and other venereal disease in the PWJ's as compared with the other groups is surprising, but is accounted for entirely by new disease acquired after liberation by Regular Army men, amongst whom routine case-finding tends to be fairly complete. The observation and its explanation are important, however, in indicating a possible basis for the excess in nearly all categories exhibited by the Pacific prisoners. This possibility turns out to be unfounded. Detailed analysis of other specific categories and groups of categories shows no significant differences between Regular Army men and inductees in proportion of cases. Furthermore, case by case examination of records in a number of categories of interest

³ These figures are taken from tables 19-22, last column.

indicates that the conditions were incurred prior to liberation. In this examination particular attention was paid to categories of disease and impairment which, unlike tuberculosis and malnutrition, would not appear to have, necessarily, a close relationship to the experiences of imprisonment, such as refractive errors of the eye, deafness, hernia, cardiovascular conditions, and diseases of bone and muscle. In no instance was there any indication that the condition arose subsequent to liberation.

The only categories not represented appreciably more frequently in the Pacific prisoners than in their controls are malaria, malignant neoplasm, psychosis, pneumonia, and peptic ulcer. All other categories are conspicuously in excess in the PWJ's. The Pacific prisoners show also a considerable excess, in comparison with the European prisoners, in all but two of these same categories—gastroenteritis or functional intestinal disorders, and wounds or injuries.

IV. DISABILITY AFTER LIBERATION

The extent of residual disability exhibited by the ex-prisoners some years after liberation, and attributable to the effects of imprisonment, may be evaluated broadly by means of the VA percentage rating for disability compensation. Past experience in studies on a number of diverse conditions (2) has demonstrated that rating distributions and mean ratings may provide valid quantitative measures for differentiating the general levels of disability among groups of men eligible for compensation; i. e., living veterans not being compensated through military retirement pay. However, it cannot be assumed that such experience has general applicability. In particular the earlier studies differ from the present one in that they dealt with groups initially differentiated on clear-cut medical grounds. In the present study, there is little opportunity for an independent evaluation of the clinical validity of differentials suggested by diversities in rating levels.

Certain practical considerations, among them costs, have limited the amount of detail on VA rating for disability examined in this initial, exploratory study. For the immediate purposes of the investigation it was deemed sufficient to make a single determination of disability rating at a late point after liberation, foregoing the question of trends in the intervening interval, and limiting somewhat consideration of the specific causes of disability. It was possible to obtain, inexpensively, and with relative completeness, the current VA claim status and disability rating, as of approximately 1 January 1953, of each man who was a living veteran at that time. The following discussion of disability as measured by VA percentage rating is confined to an analysis of that set of observations, which yield a broad measure of relative disability in survivors at a point somewhat more than 7 years after liberation of the prisoners. For the smaller number of men whose rating was 50 percent or more, information was subsequently obtained on the nature of the impairments for which they were rated.

In addition to the data on VA rating, the questionnaires obtained from a large proportion of surviving ex-prisoners provide information relevant to the general question of disability; e. g., work status and effect of health on ability to work, some of which will be discussed here.

1. THE VA RATING FOR DISABILITY COMPENSATION

a. General findings

The distribution by disability rating and the mean rating, as of 1 January 1953, of each of the four rosters, are shown in table 26. The

differences are striking, the PWJ's having a conspicuously smaller proportion of men with zero ratings or not rated and a very much larger proportion of men with higher ratings than any of the other groups, including the European prisoners. The only difference of note among the groups other than the Pacific prisoners is that between the European prisoners and their controls in proportion of men with zero rating; this difference is quite significant. In the remaining portion of the distributions for these two groups; i. e., in ratings of 10 to 100 percent, the differences are not significant. The two control groups are quite homogeneous over the total distribution, including the proportion with zero rating. All of these relations are well illustrated in the mean ratings.

TABLE 26

VA Rating for Disability Compensation, as of 1 January 1953, by Roster

| Disability rating | PWJ | | WJ | | PWE | | WE | |
|--|---------|----------|---------|----------|---------|----------|---------|----------|
| | Num-ber | Per-cent | Num-ber | Per-cent | Num-ber | Per-cent | Num-ber | Per-cent |
| Not applicable ¹ | 162 | ..... | 65 | ..... | 61 | ..... | 64 | ..... |
| Claim status unknown | 3 | ..... | ..... | ..... | 6 | ..... | ..... | ..... |
| Claim status known: | | | | | | | | |
| Total | 327 | 100.0 | 456 | 99.9 | 395 | 100.0 | 397 | 100.0 |
| Rating 0 or not rated ² | 90 | 27.5 | 323 | 70.8 | 249 | 63.0 | 287 | 72.3 |
| 10-20 | 45 | 13.8 | 85 | 18.6 | 67 | 17.0 | 58 | 14.6 |
| 30-40 | 83 | 25.4 | 27 | 5.9 | 43 | 10.9 | 23 | 5.8 |
| 50-100 | 109 | 33.3 | 21 | 4.6 | 36 | 9.1 | 29 | 7.3 |
| Mean rating | 33.6 | | 7.4 | | 12.0 | | 8.7 | |

¹ Dead, in service, or receiving retirement pay on 1 January 1953.

² No claim filed, claim pending, or claim disallowed or discontinued as of 1 January 1953.

It will be seen in table 26 that a considerably larger proportion of the PWJ's, as compared with the other groups, were still in service and not eligible for VA disability compensation. To what extent this affects the level and range of ratings in the PWJ's is not known, but it is reasonable to assume that those remaining in service were less disabled than those who were discharged. There were approximately 85 more PWJ's than WJ's or PWE's who remained in service (taking account of deaths and assuming that a proportion of the former similar to that of the others remained). Discounting the fact that a number of disabled Pacific ex-prisoners, including amputees, remained in service after liberation, if it is assumed that all of these 85 men would not have received disability compensation had they been separated, the proportion rated 0 or not rated would be 42.5 percent, the proportion rated 50-100 would be 26.5 percent, and the mean rating would be about 27, so that large differences between the PWJ's and the other groups would persist.

The nature of the more severe impairments for which compensation was paid in January 1953 is indicated by the diagnoses to which were as-

signed the ratings current at that time, among men whose total rating was 50 percent or more. Some limitation in the comparability of groups is perhaps introduced by confining the comparison to the men with the highest disability ratings, where the largest proportion of Pacific prisoners and the smallest proportion of the other groups fall. However, the limitation is not an artificial one, since it deals uniformly with the same portion of the upper range of impairment levels. By virtue of dealing with men whose disability is greatest, the device provides a somewhat sharpened means of observing differences in the kinds of impairments which characterize the groups. On the other hand it will fail to identify some occurrences of any impairments which are uniformly rated less than 50 percent.

The impairments for which ratings were still in effect at the beginning of 1953 are shown in table 27 using the same diagnostic categories as those in which the hospital diagnoses of the preceding section were classified. In the Pacific prisoners nearly every category is represented among the men with the highest disability ratings, whereas in all the other groups the men whose ratings indicate major disability are very largely those with residuals of wounds and injuries only.

b. Relations to preimprisonment factors

Of the underlying differences between rosters which are unrelated to the experience of imprisonment; i. e., with respect to component, age, and service prior to the WW II enlistment, none accounts for the roster differences in rating distributions of table 26. In every subdivision of each of these three factors (where there are enough cases to provide a valid comparison), the pattern of distribution of ratings is quite similar to the corresponding distribution of the total group.

An additional presumptively relevant factor, condition at capture, shows an interesting relationship to subsequent disability rating, as seen in table 28. Information on the state of health at the time of capture is available only from the questionnaire. In the European prisoners there is a marked association between this factor and later disability. Those PWE's who were too sick to walk at the time of capture have a distribution of ratings that is not only the reverse of the PWE's in better condition, but one which is very similar to that of the PWJ's who were in poor condition at capture. (The rating distributions of the PWJ's and PWE's in the "SIW, not ambulatory" category are not significantly different.) Among the PWJ's, the ratings also tend to shift to higher values as the condition at capture becomes poorer, but the differences here are not significant. Despite these relations, it is apparent that condition at capture plays little part in the overall roster difference in disability rating.

c. Relations to imprisonment factors

In regard to the two factors directly related to imprisonment for which data are available from the questionnaires—stress and weight loss during

TABLE 27

Impairments for Which Disability Compensation Payments Were Current as of January 1953, Among Men With VA Disability Rating of 50-100 Percent, and Number of Men in Each Category, by Roster

| Impairment | PWJ | WJ | PWE | WE |
|--|-----|------|------|------|
| Tuberculosis | 15 | 1 | 2 | |
| Dysentery | 6 | | | |
| Malaria | 3 | | | |
| Helminthous disease | 3 | | | |
| Other infective or parasitic | 2 | | | |
| Malignant neoplasm | 1 | | | |
| Beriberi | 12 | | | |
| Malnutrition, unspecified | 19 | | 1 | |
| Other nutritional deficiencies | 4 | | | |
| Psychosis | 4 | 2 | 3 | 2 |
| Psychoneurosis | 64 | 2 | 9 | 6 |
| Eye condition, nutritional deficiency | 3 | | | |
| Eye condition, not nutritional deficiency | 10 | 1 | | 1 |
| Deafness | 2 | | | |
| Other ear conditions | 1 | | 1 | 1 |
| Heart disease | 4 | 1 | | |
| Hypertension | 1 | | | |
| Varicose veins | 1 | | 1 | |
| Other diseases of arteries and veins | 2 | | | |
| Respiratory diseases, other than pneumonia | 9 | 1 | | |
| Peptic ulcer | 8 | | | |
| Gastroenteritis and functional intestinal disorder | 6 | | | |
| Disease of liver, gallbladder, and pancreas | 2 | | 1 | |
| Other diseases of digestive system | | 1 | 1 | |
| Genitourinary disease | 4 | 1 | | |
| Disease of skin and cellular tissue | 4 | | | |
| Disease of bone and muscle | 23 | 2 | 2 | |
| Wound or injury, including residual | 39 | 15 | 28 | 25 |
| Other | 9 | 1 | | |
| Total number of men rated 50 percent or more | 109 | 21 | 36 | 29 |
| Number with impairments other than residuals of wounds or injuries | 104 | 9 | 16 | 9 |
| Number of such other impairments | 222 | 13 | 21 | 10 |
| Percent with residuals of wounds and injuries only | 4.6 | 57.1 | 55.6 | 69.0 |

capture, only the latter is significantly associated with subsequent disability rating. As shown in table 29, this relationship is found in both prisoner groups, but it is apparent from these distributions that the association between weight loss and disability rating does not account in any degree for the difference in level of disability rating between the two prisoner groups.

d. Relations to VAH admissions after liberation

As is true of veterans generally, the VA hospital experience of the veterans in the four rosters of the study is markedly associated with their disability ratings. These relations are shown in table 30. Despite the strong relationship between these two factors in each roster, the overall difference in rating level between the PWJ's and the other groups is not materially af-

fectured by it. However, among veterans with zero rating the difference between rosters with respect to hospitalization does not appear.

TABLE 28

Relationship Between Condition at Capture and VA Rating for Disability Compensation 7 to 8 Years After Liberation, Pacific and European Prisoners

| Roster | Disability rating January 1953 | Condition at capture | | | | | |
|----------|-----------------------------------|----------------------|---------|-----------------|---------|---------------------|---------|
| | | Not SIW ¹ | | SIW, ambulatory | | SIW, not ambulatory | |
| | | Number | Percent | Number | Percent | Number | Percent |
| PWJ..... | Total..... | 157 | 100.0 | 125 | 100.0 | 18 | 100.0 |
| | 0..... | 51 | 32.5 | 27 | 21.6 | 2 | 11.1 |
| | 10-20..... | 23 | 14.6 | 15 | 12.0 | 3 | 16.7 |
| | 30-40..... | 38 | 24.2 | 36 | 28.8 | 5 | 27.8 |
| | 50-100..... | 45 | 28.7 | 47 | 37.6 | 8 | 44.4 |
| PWE..... | Total..... | 195 | 100.1 | 119 | 100.0 | 48 | 100.0 |
| | 0..... | 145 | 74.4 | 74 | 62.2 | 10 | 20.8 |
| | 10-20..... | 28 | 14.4 | 24 | 20.2 | 7 | 14.6 |
| | 30-40..... | 15 | 7.7 | 15 | 12.6 | 10 | 20.8 |
| | 50-100..... | 7 | 3.6 | 6 | 5.0 | 21 | 43.8 |

¹ Sick, injured, or wounded.

TABLE 29

Relationship Between Weight Loss During Imprisonment and VA Rating for Disability Compensation 7 to 8 Years After Liberation, Pacific and European Prisoners

| Roster | Disability rating January 1953 | Weight loss, in pounds, during imprisonment | | | | | |
|----------|-----------------------------------|---|---------|--------|---------|--------|---------|
| | | <40 | | 40-59 | | ≥60 | |
| | | Number | Percent | Number | Percent | Number | Percent |
| PWJ..... | Total..... | 28 | 100.1 | 101 | 100.1 | 171 | 100.0 |
| | 0..... | 15 | 53.6 | 25 | 24.8 | 39 | 22.8 |
| | 10-20..... | 5 | 17.9 | 12 | 11.9 | 24 | 14.0 |
| | 30-40..... | 3 | 10.7 | 35 | 34.7 | 42 | 24.6 |
| | 50-100..... | 5 | 17.9 | 29 | 28.7 | 66 | 38.6 |
| PWE..... | Total..... | 169 | 99.9 | 108 | 100.0 | 68 | 100.0 |
| | 0..... | 122 | 72.2 | 63 | 58.3 | 31 | 45.6 |
| | 10-20..... | 19 | 11.2 | 26 | 24.1 | 13 | 19.1 |
| | 30-40..... | 9 | 5.3 | 15 | 13.9 | 14 | 20.6 |
| | 50-100..... | 19 | 11.2 | 4 | 3.7 | 10 | 14.7 |

TABLE 30

Relationship Between VA Hospital Admissions in the 6 Years After Liberation and VA Rating for Disability Compensation 7 to 8 Years After Liberation: 4 Rosters

| Disability rating January 1953 | VAH admissions per 100 veteran-years | | | |
|--------------------------------|--------------------------------------|------|------|------|
| | PWJ | WJ | PWE | WE |
| Total..... | 10.0 | 3.1 | 2.2 | 1.6 |
| 0..... | 1.1 | 1.7 | .7 | .6 |
| 10-30..... | 6.8 | 5.0 | 2.7 | 2.8 |
| 40-60..... | 12.7 | 10.1 | 7.7 | 4.5 |
| 70-100..... | 26.9 | 17.4 | 12.5 | 11.7 |

2. HEALTH STATUS AND WORK PERFORMANCE AS REPORTED ON THE QUESTIONNAIRE

The man's own evaluation of the effect of his health upon his working ability is relevant to the general question of disability. The questionnaire provides such information and also a report of hours worked during a specified week in January 1953. A more complete consideration of the facts reported by the ex-prisoners on their questionnaires, including such matters as completeness of response, bias, and validity of the facts reported, is the subject of the next section. Here it will suffice to compare the two groups with respect to what they have reported relative to the question of disability. Table 31 presents comparative figures on four items of interest. It is of course reasonable to have reservations about the accuracy of self-evaluations of state of health and effect of health on work, particularly where broad qualitative terms are used, and some motivation for exaggeration may exist. However, the sole interest here is the intergroup comparison, and since such questions of reliability apply in both groups, there is little reason to question the informativeness of the differences between the two groups. On the other hand, more objective facts such as "hours worked" and "reason for not working" are presumably reported reasonably accurately, and insofar as their distributions show similar relations in the intergroup comparison to those shown by the more subjective statements, some measure of validity can be ascribed to the latter.

In table 31 the difference between the Pacific and European prisoners is highly significant in every factor of interest, i. e., those in good health and in poor health, those who did not work during the specified week for all reasons and because of health; and, among those who worked, in the proportion who worked less than 25 hours and the proportion who stated that their health interfered with work.

TABLE 31

*Health and Work Status in January 1953 as Reported on Questionnaire:
PWJ and PWE*

| Health and work status | PWJ | | PWE | |
|--|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Questionnaires returned | 425 | ..... | 419 | ..... |
| Health status reported, total | 421 | 100.0 | 417 | 100.1 |
| Good | 104 | 24.7 | 175 | 42.0 |
| Fair | 200 | 47.5 | 190 | 45.6 |
| Poor | 117 | 27.8 | 52 | 12.5 |
| Work status reported, total | 421 | 100.0 | 418 | 100.0 |
| Worked week of 4 January | 331 | 78.6 | 365 | 87.3 |
| Did not work | 90 | 21.4 | 53 | 12.7 |
| Reason reported, total | 89 | 100.0 | 52 | 100.0 |
| Because of health | 42 | 47.2 | 12 | 23.1 |
| Other reason | 47 | 52.8 | 40 | 76.9 |
| Worked during week: | | | | |
| Hours reported, total | 321 | 100.0 | 358 | 99.9 |
| Less than 25 hours | 30 | 9.3 | 13 | 3.6 |
| 25-39 hours | 34 | 10.6 | 42 | 11.7 |
| 40-49 hours | 206 | 64.2 | 226 | 63.1 |
| 50 hours or more | 51 | 15.9 | 77 | 21.5 |
| Effect of health on work reported, total | 319 | 100.0 | 356 | 100.0 |
| Health interfered | 169 | 53.0 | 120 | 33.7 |
| Health did not interfere | 150 | 47.0 | 236 | 66.3 |

V. RECOLLECTION OF PRISON EXPERIENCE; HEALTH AND ADJUSTMENT OF THE EX-PRISONERS IN 1953: EVIDENCE FROM THE QUESTIONNAIRE

1. PURPOSE AND DESIGN OF THE QUESTIONNAIRE

Experience in earlier record follow-up studies(2) has demonstrated the special value of a complete questionnaire survey of survivors. Recorded information is generally subject to varying, and at times considerable, delays in becoming accessible. In particular, those men on a roster whose health, disability, or other status of interest became stabilized early may be represented only by records several years old. In record studies, particularly those in which timeliness is pertinent, the questionnaire serves the important purpose of bringing relevant facts up to date, specifically in permitting positive verification of current survival. In addition, the questionnaire often provides information which is not available from any other source. This has been particularly true in the present study where some of the facts in the experience of imprisonment were only rarely found in records, but were readily supplied by the men.

The questionnaire used in the study is shown in the appendix. Questions 1, 2, and 7 ask for specific facts by which to verify identity and check the accuracy of response. Questions 3 to 6 and 8 were introduced specifically to supply facts which were frequently missing in available records. Question 9 was designed to gain a complete picture of total hospitalizations, particularly those outside the military and VA systems. The information derived from this question was discussed in section III. The remainder of the form was intended to provide information on current health, occupation, and work status and their interrelations. Questions 12 to 14 were designed in agreement with the nature and timing of information collected in the Current Population Survey of the Bureau of the Census, so that appropriate baselines for the evaluation of work status could be assured.

2. COMPLETENESS OF RESPONSE AND VALIDITY OF THE FACTS REPORTED

The response of ex-prisoners to the questionnaire was greater than in any groups previously studied in this program (table 32). Of the 929 men not known to have died, 921, or 99 percent, were located (i. e., found to be living at a specific street address), and of these 861, or 93.5, answered the questionnaire. The figures for the two groups are substantially the same.

The possibility that some degree of bias may be associated with non-response seems slight. In both rosters the response rate remains relatively uniform when specified with respect to component, rank, age, education, marital status, residence, weight deviation from standard, civilian occupation, service prior to capture, hospitalization in service prior to capture, and duration of imprisonment.

The respondent's reports of the dates of their capture and liberation furnish a check of both identity and accuracy of response. The question of accuracy as so measured refers, of course, primarily to recall. Such a test does not gauge the validity of answers where motivations exist for minimizing or exaggeration, or where clinical matters are misunderstood. In these

TABLE 32
Questionnaire Response, PWJ and PWE

| | Total | | PWJ | | PWE | |
|--|--------|---------|------------------|---------|------------------|---------|
| | Number | Percent | Number | Percent | Number | Percent |
| Total on rosters | 954 | ..... | 492 | ..... | 462 | ..... |
| Died prior to Q mailing | 25 | ..... | 23 | ..... | 2 | ..... |
| Questionnaires mailed | 929 | 100.0 | 469 | 100.0 | 460 | 100.0 |
| Returned | 861 | 92.7 | ¹ 437 | 93.2 | ² 424 | 92.2 |
| Not returned | 68 | 7.3 | 32 | 6.8 | 36 | 7.8 |
| Number of men located | 921 | 99.1 | 465 | 99.1 | 456 | 99.1 |
| Percent of located men returning Q . . . . . | ..... | 93.5 | ..... | 94.0 | ..... | 93.0 |

¹ Twelve were received too late for inclusion in other tables.

² Five were received too late for inclusion in other tables.

TABLE 33

Comparison of Questionnaires (Q) and Records (R) in Reporting of Dates of Capture and Liberation

| | PWJ | | PWE | |
|---|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Date of capture: | | | | |
| Questionnaires reporting date | 424 | 100.0 | 418 | 100.0 |
| Q and R agree, month and year | 387 | 91.3 | 384 | 91.9 |
| Disagree by >1 month, <6 months | 29 | 6.8 | 13 | 3.1 |
| Disagree by ≥6 months | 8 | 1.9 | 21 | 5.0 |
| Date of liberation: | | | | |
| Questionnaires reporting date | 420 | 100.0 | 410 | 100.0 |
| Q and R agree, month and year | 345 | 82.1 | 316 | 77.1 |
| Disagree by >1 month, <6 months | 70 | 16.7 | 78 | 19.0 |
| Disagree by ≥6 months | 5 | 1.2 | 16 | 3.9 |

areas more indirect checks must be used, although it seems reasonable to conclude, from the equal response rates of the two groups of prisoners, that there is no appreciable difference between them in such tendencies.

The extent of agreement in dates of capture and liberation reported on the questionnaire and found in records is shown in table 33. For date of capture the agreement is quite high: over 90 percent of the respondents state the correct month and year. There is appreciably less agreement as to date of liberation, but this is very likely due more to a difficulty in the records than inaccuracy on the questionnaire, since the former often show only date of return to military control, which in some cases was more than a month later than liberation.

In a limited number of cases information is available from records by which the men's statements on condition at capture may be checked directly. In the following summary the total figure in each instance is the number of cases in which both the record and the questionnaire supply the relevant facts:

| | PWJ | | PWE | |
|----------------------------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Total..... | 169 | 100.0 | 211 | 100.0 |
| R and Q agree..... | 120 | 71.0 | 185 | 87.7 |
| Sick, injured, or wounded: | | | | |
| R show "no," Q "yes"..... | 44 | 26.0 | 12 | 5.7 |
| R show "yes," Q "no"..... | 5 | 3.0 | 14 | 6.6 |

The evidence here of a tendency for the Pacific prisoners to overstate an adverse situation may be indicative of the facts, but this is by no means conclusive. It is clear that few records created after liberation are likely to carry a specific statement that this man was in good health when captured. A careful examination of the available records showed that only for 169 cases, or 40 percent of those with matching questionnaires, was there an acceptable indication of the man's condition on the day of capture. Reference to a morbid condition was usually unequivocal, but indication of its absence, while positive, was in some degree inferential, so that the possibility of error exists. The conclusion was reached that some tendency to an overstatement of morbidity is present in the questionnaires, but that its magnitude is not as great as is implied by the estimate that the statements of 26 percent of the men are contradicted by the records. The presence of this type of error needs to be kept in mind in considering the questionnaire results, but does not appear to warrant undue emphasis. Other opportunities for checking against recorded information present themselves in the following discussion of specific findings.

3. PRISON EXPERIENCE AS REPORTED BY THE MEN

The high rate of questionnaire returns indicates a positive motivation toward response and suggests that the opportunity to inform, or unburden to, an impartial medical organization, was welcomed by the former prisoners. This presumption is further supported by the unusually full, voluntarily supplied accounts of prison experiences and subsequent history provided by the men. However, a systematic review and summary of these freely written (and often lengthy) statements was not undertaken. Files of the War Claims Commission and other interested Federal agencies contain large numbers of such informative accounts, many of which are detailed and documented, and provide the basis for the well-publicized information on prison camp mistreatment and atrocity, particularly with respect to the Japanese prison camps. The questionnaire statements corroborate the available facts but add nothing new so that the special task of systematizing this information does not appear justified for the purposes of this report. The possible advantage inherent in having reports from a random sample of ex-prisoners is mitigated by the fact that those impelled to relate their experiences can hardly be considered an unbiased subsample.

The more limited information on medical care received and types of stress experienced during imprisonment was uniformly sought in explicit form and can be readily summarized in tabular form. The facts of medical treatment as reported are shown in table 34. All but one of the Pacific prisoners said they needed treatment whereas 68, or 16.4 percent, of the European prisoners needed none. Although, in comparison with the European prisoners, a much greater proportion of Pacific prisoners who needed treatment received it, in most cases such treatment came from fellow-prisoners who were physicians. Where treatment was received from enemy doctors, good treatment was rarely encountered by the Pacific prisoners, but among the European prisoners more than a third felt the treatment was good. It is of course uncertain to what extent the respondents interpreted "treatment" as referring to medical competence and facilities as distinguished from personal attitude and interest.

The information available on stressful experiences during imprisonment is clearly far too limited to provide a realistic evaluation of the amount of stress to which these men were subjected. Each of the items reported on (see table 35) has a wide range of intensity, depending on duration, frequency, or severity, and, without some indication of degree, the actual magnitude of stress cannot be measured. The only conclusions that can be drawn from the data of table 35 are that physical injury or abuse was much more common in the Pacific prisoners than in the European, whereas the stress associated with solitary confinement, enforced idleness, and insufficient food were as frequent in the European prisoners as in the Pacific; in the case of enforced idleness, appreciably more frequent. It should be

recalled, in this connection, that 80 percent of the PWJ's were held for 40 months or more, while over 60 percent of the PWE's were held less than a year and only 9 percent more than 2 years.

TABLE 34

Medical Treatment During Imprisonment, as Reported on the Questionnaire, PWJ and PWE

| Medical treatment | PWJ | | PWE | |
|--|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Number of questionnaires reporting | 424 | ..... | 415 | ..... |
| Treatment not needed | 1 | ..... | 68 | ..... |
| Treatment needed, total | 423 | 100.0 | 347 | 100.0 |
| None received | 31 | 7.3 | 89 | 25.6 |
| Received only from a fellow prisoner (M. D.) | 290 | 68.6 | 130 | 37.5 |
| Received from enemy doctors | 102 | 24.1 | 128 | 36.9 |
| Quality of treatment received from enemy doctors: | | | | |
| Total | 102 | 100.0 | 128 | 100.0 |
| Good | 4 | 3.9 | 47 | 36.7 |
| Poor | 98 | 96.1 | 81 | 63.3 |

TABLE 35

Types of Stress Experienced During Imprisonment, as Reported on the Questionnaire, PWJ and PWE

| Type of stress | PWJ | | PWE | |
|---|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Number reporting | 425 | ..... | 419 | ..... |
| Death march | 221 | 52.0 | 164 | 39.1 |
| Solitary confinement | 112 | 26.4 | 129 | 30.8 |
| Excessive hard labor | 370 | 87.1 | 122 | 29.1 |
| Witnessed other PW's punished or killed | 410 | 96.5 | 208 | 49.6 |
| Received punishment | 329 | 77.4 | 71 | 16.9 |
| Enforced idleness | 35 | 8.2 | 106 | 25.3 |
| Mistreatment on prison ship or train | 326 | 76.7 | 54 | 12.9 |
| Insufficient food | 419 | 98.6 | 407 | 97.1 |
| Mistreatment by other PW's | 28 | 6.6 | 4 | .9 |
| Subjected to air raid by allied forces | 315 | 74.1 | 301 | 71.8 |
| None | 1 | ..... | 5 | ..... |

The distributions of number of stress items reported per man are shown in table 36. Insofar as these data can represent a quantitative difference in stress, the Pacific prisoners report very much more than the European prisoners. However, since these statements of types of stress experience do not take into account the greater duration of imprisonment and the evidence

of greater severity of any one type of stress in the Pacific group, the figures of table 36 must be a considerable understatement of the true magnitude of the difference.

4. HEALTH STATUS IN 1953

The difference between the two prisoner groups in their evaluation of their general health was discussed briefly in connection with disability. A more detailed comparison is shown in table 37, and in table 38 is given a summary of the explanations provided for the statements about health. These indicate in a general way differences between the two groups in agreement with their previously observed differences in morbidity, but, as would be expected, both groups express a good deal more illness in the form of

TABLE 36

Number of Different Types of Stress Experienced During Imprisonment, as Reported on the Questionnaire, PWJ and PWE

| Number of stress items checked | PWJ | | PWE | |
|--------------------------------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Total reporting | 425 | 99.9 | 419 | 99.9 |
| None | 1 | .2 | 5 | 1.2 |
| 1 | 3 | .7 | 27 | 6.4 |
| 2 | 3 | .7 | 57 | 13.6 |
| 3 | 12 | 2.8 | 100 | 23.9 |
| 4 | 39 | 9.2 | 93 | 22.2 |
| 5 | 77 | 18.1 | 84 | 20.0 |
| 6 | 114 | 26.8 | 35 | 8.4 |
| 7 | 110 | 25.9 | 14 | 3.3 |
| 8 | 53 | 12.5 | 3 | .7 |
| 9 | 12 | 2.8 | 1 | .2 |
| 10 | 1 | .2 | | |
| Average per man | 6.08 | | 3.76 | |

TABLE 37

Health Status, as Reported on the Questionnaire, PWJ and PWE

| Health status reported, total | PWJ | | PWE | |
|---|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Health status reported, total | 421 | 100.0 | 417 | 100.1 |
| Very good | 18 | 4.3 | 39 | 9.4 |
| Good | 86 | 20.4 | 136 | 32.6 |
| Fair | 200 | 47.5 | 190 | 45.6 |
| Poor | 97 | 23.0 | 47 | 11.3 |
| Very poor | 20 | 4.8 | 5 | 1.2 |

TABLE 38

Explanation of Health on Questionnaire, PWJ and PWE

| | PWJ | | PWE | |
|--|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Total questionnaires..... | 425 | 100.0 | 419 | 100.0 |
| No complaints..... | 86 | 20.2 | 150 | 35.8 |
| Vague symptoms or complaints only..... | 81 | 19.1 | 119 | 28.4 |
| Specific disorders other than emotional.... | 92 | 21.6 | 67 | 16.0 |
| Symptoms suggesting emotional disturbance..... | | | | |
| Total..... | 166 | 39.1 | 83 | 19.8 |
| Without specific disorder..... | 86 | 20.2 | 63 | 15.0 |
| With specific disorder..... | 80 | 18.9 | 20 | 4.8 |

complaints than was indicated by the morbidity levels measured by hospitalization. This shows up primarily in the category of vague symptoms and complaints; i. e., those complaints stated in indefinite terms which could not be assigned to any of the broad classes of illness. Examples of such statements are "pain in the back," "headache," "don't feel good," "stomach ache," "sore foot." The actual frequencies of each type of complaint are shown in table 39.

The relations of these complaints to health status are shown in table 40, in which three interesting patterns of relationship appear, particularly in the Pacific prisoners. The strong association between the claim of good health and the absence of complaints follows expectations, as does the opposite association among those with complaints. However, in the latter, the association between complaints indicating emotional disturbance and the claim of poor health is much more marked than when the complaints do not suggest emotional disorder. This contrast is sharply illustrated within the group who report specific disorders; i. e., organic or infectious illnesses. Those who register such complaints, and in addition indicate emotional difficulties are quite different in their health status distribution from the organic-infectious illness group not reporting nervousness, tensions, etc., but are quite similar in this respect to those not claiming specific organic or infectious illnesses. This latter relation is not apparent in the European prisoners, although there is a suggestion of it in the small group with indications of emotional difficulties only.

On the other hand the close similarity in health status distribution between those having vague complaints (i. e., nonspecific symptoms which do not indicate their basis) and those with specific disorders but not indicating associated emotional disturbance, has a special interest. The class of vague symptoms was initially set up with some doubts as to the validity of its differentiation from the other diffuse category of emotionally based symptoms (compare, e. g., "don't feel well," assigned to the first category,

TABLE 39

Frequency of Each Type of Complaint Reported on the Questionnaire, PWJ and PWE

| Complaint | PWJ | PWE |
|---|------|------|
| None..... | 84 | 146 |
| Vague symptoms or complaints..... | 266 | 220 |
| Specific organic disease, noninfectious..... | 26 | 12 |
| Specific infectious or parasitic disease..... | 30 | 2 |
| Symptoms suggesting emotional disturbance ¹ | 166 | 83 |
| Specific indications of residuals of nutritional deficiency..... | 84 | 26 |
| Loss of part, injury, deformity, or other similar impairment..... | 80 | 60 |
| Total complaints..... | 652 | 403 |
| Number reporting..... | 425 | 419 |
| Complaints per man..... | 1.53 | 0.96 |
| Complaints other than "vague"..... | 386 | 183 |
| Per man..... | 0.91 | 0.44 |

¹ Nervous, nerves bad, depressed, difficulty in sleeping, restless, tires easily, tense, etc.

TABLE 40

Relation of Health Status to Type of Complaint, as Reported on the Questionnaire, PWJ and PWE

| Group | Health status | No complaints | | Vague complaints only | | Specific disorders | | | | Symptoms of emotional disturbance only | |
|-----------|---------------|---------------|---------|-----------------------|---------|--------------------|---------|--|---------|--|---------|
| | | | | | | Only | | With symptoms of emotional disturbance | | | |
| | | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| PWJ..... | Total..... | 85 | 99.9 | 81 | 100.0 | 90 | 100.0 | 86 | 100.0 | 79 | 99.9 |
| | Good..... | 62 | 72.9 | 13 | 16.0 | 16 | 17.8 | 8 | 9.3 | 5 | 6.3 |
| | Fair..... | 16 | 18.8 | 46 | 56.8 | 54 | 60.0 | 43 | 50.0 | 41 | 51.9 |
| PWE..... | Poor..... | 7 | 8.2 | 22 | 27.2 | 20 | 22.2 | 35 | 40.7 | 33 | 41.7 |
| | Total..... | 150 | 100.0 | 118 | 100.0 | 67 | 100.0 | 62 | 100.1 | 20 | 100.0 |
| | Good..... | 122 | 81.3 | 28 | 23.7 | 13 | 19.4 | 12 | 19.4 | ----- | ----- |
| Fair..... | 25 | 16.7 | 72 | 61.0 | 43 | 64.2 | 37 | 59.7 | 13 | 65.0 | |
| Poor..... | 3 | 2.0 | 18 | 15.3 | 11 | 16.4 | 13 | 21.0 | 7 | 35.0 | |

with "can't sleep" assigned to the latter). The present data suggest that the categorical differentiation, originally made on *a priori* grounds, has some validity, in that men with vague symptoms alone distribute themselves as to state of health in the same way as those with specific disorders, and rather differently from those whose concern about their health appears to be partly or wholly on the basis of emotional disturbance.

Beyond these details, perhaps the point of main interest in these data is that men who appear to be emotionally disturbed are more prone to put a low mark on their general state of health than those who associate their discomforts with somatic states or symptoms, whether nonspecific or attributable to organic disease. This familiar situation, probably generally encountered in medical practice, suggests a measure of authenticity in the information the respondents are seeking to convey.

5. EMPLOYMENT STATUS, OCCUPATION, AND WORK STATUS IN 1953

As previously stated, information on employment, occupation, and hours worked was sought on the questionnaire in a form that would lend itself to ready comparison with corresponding data available for the general population. These population data are estimates derived by the Bureau of the Census from its monthly Current Population Survey. The ex-prisoners were asked to supply the facts of their employment status and the number of hours worked, if employed, during a specific survey week, that of 4-10 January 1953.

The Census Bureau emphasizes that its estimates are affected by sampling variability which may be quite large for estimated frequencies that are small, and that there is known to be an underenumeration of veterans in the survey sample. The latter point is of special pertinence, since the aim of this study is to distinguish the effects of imprisonment from those associated not only with combat but also with military service in general. The employment and work status of veterans as a group cannot be assumed to be closely similar to those of the population at large. A small proportion of veterans are handicapped by the residuals of battle injuries, a larger proportion are the recipients of compensation for service-incurred disabilities of all kinds, and for many training in new skills during military service placed them in types of employment or occupations different from those they would otherwise have entered.

In view of these considerations, and in the absence of comparable questionnaire information from the combat controls of the study, the CPS employment and occupation estimates for all veterans serve to fill, at least partially, a need which could not otherwise be met. In the following comparisons both these and the estimates for all males in the population aged 25-44 (89 percent of World War II veterans were in this age range in 1953) are used. Such diversities as appear in these comparisons are best viewed, for the present, as suggestive rather than definitive. Some of the more conspicuous differences appear to be of interest. For example, as seen in table 41 on employment status, a smaller proportion of the Pacific prisoners are in the labor force than is the case in European prisoners, in veterans generally, and in the appropriate segment of the population as a whole. This difference appears to be related to the observation that of those Pacific prisoners not in the labor force the great majority are unable to work, the proportion in this category being very much greater than the corresponding figure for veterans generally and for all United States males of similar age range. On the other hand the very small sample of European prisoners not in the labor force shows a proportion not able to work nearly as large as that in the Pacific group. The fact that by and large the European prisoners have shown in this study very little residual effect of imprisonment raises the question of whether this observation can be ascribed to the consequences of imprisonment as distinguished from relatively intensive combat experience. The figure for

total veterans is not helpful here, since it is likely that not more than 25 percent (6) of those who served in World War II actually saw combat.

Tables 42 and 43 show, for *employed* ex-prisoners, their occupational distribution and the number of hours worked in the survey week, respectively. The indications from these data are of interest for the record, but for the most part do not justify specific comment, in view of the questions raised in connection with the data of table 41. However, it is worth

TABLE 41

Employment Status in Week Ending 10 January 1953, as Reported on the Questionnaire: PWJ and PWE Compared With World War II Male Veterans and With U. S. Males Aged 25-44

| Employment status | PWJ | | PWE | | World War II male veterans (percent) ¹ | U. S. Males ages 25-44 (percent) ¹ |
|-------------------------|--------|---------|--------|---------|---|---|
| | Number | Percent | Number | Percent | | |
| Total..... | 300 | 100.0 | 380 | 100.0 | 100.0 | 100.0 |
| In labor force..... | 254 | 84.7 | 364 | 95.8 | 97.3 | 97.9 |
| Employed..... | 240 | 79.5 | 353 | 92.9 | 97.5 | 97.5 |
| Unemployed..... | 14 | 4.5 | 11 | 2.9 | 2.5 | 2.5 |
| Not in labor force..... | 46 | 15.3 | 16 | 4.2 | 2.7 | 2.1 |
| In school..... | 5 | 1.7 | 4 | 1.1 | 3.2 | 3.8 |
| Unable to work..... | 37 | 12.3 | 12 | 3.1 | 16.6 | 21.4 |
| Other..... | 4 | 1.3 | — | — | 50.8 | 59.8 |

¹ Source: U. S. Bureau of the Census, Current Population Reports: Monthly Report on the Labor Force: January 1953.

² Excludes respondents still in service, and 2 veterans in each group not reporting employment status.

³ Retired from Army.

TABLE 42

Occupation as Reported on the Questionnaire: PWJ and PWE Compared With World War II Male Veterans and With U. S. Males Aged 25-44, as of January 1953: Employed Workers Only

| Major occupation group | PWJ | | PWE | | World War II male veterans ¹ | U. S. males, ages 25-44 ¹ |
|--|--------|---------|--------|---------|---|--------------------------------------|
| | Number | Percent | Number | Percent | Percent | Percent |
| | | | | | Percent | Percent |
| Total..... | 237 | 100.0 | 338 | 100.0 | 100.0 | 99.9 |
| Professional, technical, etc... | 40 | 16.9 | 28 | 8.3 | 10.2 | 9.5 |
| Managers, officials, and proprietors, except farm..... | 21 | 8.9 | 26 | 7.7 | 12.9 | 12.7 |
| Clerical and kindred workers..... | 29 | 12.2 | 19 | 5.6 | 8.8 | 7.0 |
| Sales workers..... | 19 | 8.0 | 34 | 10.1 | 7.0 | 5.9 |
| Craftsmen, foremen, etc..... | 52 | 21.9 | 78 | 23.1 | 21.4 | 21.0 |
| Operatives and kindred workers..... | 35 | 14.8 | 95 | 28.1 | 23.6 | 23.9 |
| Service workers..... | 9 | 3.8 | 20 | 5.9 | 5.3 | 5.1 |
| Laborers, except farm and mine..... | 15 | 6.3 | 21 | 6.2 | 6.3 | 6.9 |
| All farmworkers..... | 17 | 7.2 | 17 | 5.0 | 4.5 | 7.9 |

¹ Source: U. S. Bureau of the Census, Current Population Survey, week ending Jan. 10, 1953 (unpublished estimates).

² Excludes 3 not reporting occupation.

³ Excludes 15 not reporting occupation.

noting that, of the Pacific prisoners who were employed, a smaller proportion worked 35 hours or more, as compared with any of the other groups (table 43).

TABLE 43

Hours Worked in Week Ending 10 January 1953: PWJ and PWE Compared With World War II Male Veterans and With U. S. Males Aged 25-44: Employed Workers Only

| Hours worked 4-10 January 1953 | PWJ | | PWE | | World War II male veterans ¹ | U. S. males, ages 25-44 ¹ |
|-----------------------------------|-------------|--------------|-------------|--------------|--|---|
| | Num- ber | Per- cent | Num- ber | Per- cent | | |
| | | | | | Percent | Percent |
| Total | 233 | 100.0 | 349 | 100.1 | 99.9 | 100.0 |
| 35 or more | 171 | 73.4 | 293 | 84.0 | 90.8 | 89.5 |
| 15-34 | 38 | 16.3 | 33 | 9.5 | 5.9 | 6.5 |
| 1-14 | 8 | 3.4 | 1 | .3 | .7 | .8 |
| With a job, not at work | 16 | 6.9 | 22 | 6.3 | 2.5 | 3.2 |

¹ Source: U. S. Bureau of the Census, Current Population Survey, week ending Jan. 10, 1953 (unpublished estimates).

² Excludes 7 not reporting hours.

³ Excludes 4 not reporting hours.

VI. DISCUSSION

The foregoing account describes the results of a broad examination of the effects of imprisonment which persist after liberation. The objective toward which this study may be considered a first step is an evaluation, in clinical and pathological as well as statistical terms, of the precise nature and extent of the lasting impairments attributable to imprisonment, and their specific effects on survival and health. However, realization of the possible range and complexity of the consequences of imprisonment suggested that an investigation initially planned to approach the problem exhaustively would be both costly and inefficient, and indicated the advisability of first undertaking an exploratory record study. The rationale of such an approach is that any resulting impairments sufficiently severe or lasting to be of interest will manifest themselves as measurable increases in mortality, morbidity, or disability; that evaluations at this level can be made relatively simply and inexpensively by the examination of existing records; and that initially the precise nature of the impairments is secondary to the question of whether, collectively, they produce effects at the grosser level.

This approach is of particular usefulness in two respects: (1) it is exceptionally comprehensive in that the indexes thus derived should reflect approximately the full variety of significant impairments, and (2) observations in excess of expectations point, directly or indirectly, to areas of special interest in which more intensive study may be made. Thus far, several major differentials appear to have been clearly marked out. Foremost among these is the observation that the Pacific prisoners who survived imprisonment were, without question, adversely affected by that experience, whereas the European prisoners showed no measurable effect of their imprisonment, at least during the first 6 years after liberation. The negative findings in the European group appear to be sufficiently well established to conclude that more intensive study of this group, for the period thus far observed, is not indicated. On the other hand, while the likelihood that delayed effects will appear later seems small, this possibility cannot be ruled out. Accordingly, some additional record follow-up of the European prisoners at a future date seems necessary, to check the possibility of delayed effects, or otherwise to confirm the early findings.

For the Pacific prisoners the evidence is unequivocal that the effects of imprisonment resulted in a markedly reduced survival potential at liberation. A question of considerable importance is whether the early mortality excess eliminated a major portion of the group's unfavorable survival expectation. If the early mortality was largely the residual consequences of

forces which operated only during imprisonment and quickly ceased to be effective after liberation, did the extraordinary mortality experienced during imprisonment select out a group of men of exceptional viability in the long run? Or, on the other hand, was the presumptive favorable survival capacity of the survivors diminished or canceled, or perhaps even reversed, by lasting effects of the selective forces which they resisted for a longer time than many? It seems clear that the questions related to the future course of overall mortality demand continued follow-up to determine the outcome of the general survival picture over a considerable period of time, certainly not less than 10 additional years and preferably more.

The causes of death which appear to account for most or all of the observed mortality excess are of particular interest. The frequency of tuberculosis deaths was not unexpected; more pertinent is the question of whether the extraordinary incidence of tuberculosis is symptomatic of generalized underlying impairments in a large proportion of the ex-prisoners, such as those following prolonged malnutrition described by Keys et al. (7). The degree and duration of malnutrition experienced by the Pacific prisoners could well have been sufficient to result in obscure irreversible structural and functional changes which might be expected to affect longevity. In consequence of such changes, decreased resistance to infection may be only one of several or many manifestations which could appear later with increasing age.

The excess of accidental deaths appears to deserve more detailed examination than has been possible in this study so far. The ready implication of a psychological basis can be, for the present, no more than speculative. It would be desirable to know in some detail at least the circumstances of each accident and something about the personality and behavior of the men prior to their death. Such information does not, for most of the men, appear to be readily available in records, and it may prove to be quite difficult to obtain. A possible approach is through interviews of wives, parents, or other close relatives, but problems of cooperativeness and reliability of information are likely to be encountered, and an appropriate special control group similarly evaluated would seem to be required.

In any event the mortality findings and their implications suggest the existence of organic and emotional residuals of imprisonment severe enough to be factors affecting survival, and raise many questions concerning the future survival potential of those still alive and their long run morbidity and disability expectations.

The early morbidity and disability observations are quite consistent with those of mortality. The frequency and variety of illnesses exhibited by the Pacific prisoners after liberation are striking and appear to involve almost all organ systems. Functional disorders, both physiological and emotional, are less well defined, but to the extent that they can be perceived are equally in excess, as compared with both controls and European prison-

ers. It is of particular interest that most of this illness, insofar as it is measured by the records of hospitalization, is manifested in the first year after liberation, and subsequently falls off sharply, with indications that by the sixth year the level of morbidity has begun to approach that of the controls. It is important to know whether this trend of hospitalization, through this relatively brief period, is indicative of substantial and lasting improvement. Early intensive medical care may result in appreciable amelioration of overt symptoms, without bringing about a major favorable change in eventual outcome, as is well known in many specific chronic conditions. For a group characterized by manifesting a considerable variety of chronic disease, following a history of severe physical, nutritional, and psychic onslaught, the question of possible permanent impairment is not necessarily answered by observation of short-term improvement, particularly when measured at the relatively gross level of hospitalization. The answer can come only from continued and probably more direct observation.

Information of interest in this connection is found in disability status as measured by VA ratings for compensation, and health and work status as reported on the questionnaire, in both instances as of the year 1953, more than a year after the end of the observation period in which mortality and hospitalization were evaluated. Although the time difference has little significance as regards long-term outlook, the facts indicate persistent morbidity and impairment below the level of severity requiring hospitalization. It is true that neither piece of evidence is unequivocal. Disability ratings may be carried forward, by virtue of legal and administrative requirements, for a few years beyond the point where the impairments for which they were assigned have improved. The complaints reported on the questionnaire often lack specificity, and the responses in general cannot be considered as wholly objective. Nevertheless, with respect to both sets of facts these same limitations apply to the other groups studied, so that the considerably greater disability level of the PWJ's as compared with either the WJ's or the PWE's, and the appreciably more frequent complaints of sickness and the indications of less satisfactory work adjustment on the questionnaire of the PWJ's as compared with those of the PWE's, represent specific suggestive evidence of a continued excess of unhospitalized morbidity in the Pacific group.

The chronic conditions which are noticeably frequent and persistent in the PWJ's are tuberculosis, residuals of malnutrition, psychoneurosis, ophthalmological changes, gastrointestinal disorders, and cardiovascular conditions. Some if not all of these may indicate specific areas worth more intensive investigation, for example, by direct clinical examination of appropriate small samples of ex-prisoners not so affected, to determine the possible presence of such conditions at a subclinical level. In this connection it would be desirable to devise more thoroughgoing autopsies than

those so far available, as deaths occur in the future among the ex-prisoners followed in this study or among Pacific ex-prisoners in general. Since the relationship of any findings to the experience of imprisonment may often be obscure, the continued use of controls in both clinical and post-mortem studies would seem to be required.

VII. SUMMARY

An exploratory record follow-up study of white, Army, male survivors of imprisonment by the Japanese and Germans during World War II has been described and a systematic account of the findings presented. The plan of the study is characterized by three main features:

1. Use of representative samples of ex-prisoners.
2. Use of specially selected controls.
3. Total dependence on records and questionnaires.

By both intent and accomplishment, the study does not purport to be more than an examination of the surface of the problem. Its purpose is to delineate the broader consequences of imprisonment which manifest themselves as increases in mortality, hospitalization, disability, health status, and work adjustment, to measure the magnitude of these changes, and to describe the gross findings, usually recorded as diagnoses or causes of death, associated with them. By this means it could be hoped to discover, with relative efficiency and minimum expense, whether important sequelae exist, and if they do, the kinds of impairments they represent and thus to describe the areas worth further study.

The specific findings of the investigation are:

1. The survivors of imprisonment by the Japanese experienced a marked excess of mortality during the first 2 years after liberation and a diminished but apparently persistent excess during the next 4 years. The European prisoners, on the other hand, showed no early effect on mortality.
2. The principal causes of death responsible for the mortality excess in the Pacific prisoners are tuberculosis and accidents.
3. After liberation the Pacific prisoners exhibited a wide variety of illnesses as shown by hospital diagnoses. These occurred with frequencies far in excess of those shown by the control groups or the European prisoners, and represent nearly every major category of disease. In the European group there was not found a great deal more illness after liberation than was observed in their controls, although they did show a relative excess of malnutrition, psychoneurosis, and gastrointestinal disorders.
4. By far the greater part of the morbidity exhibited by hospital diagnoses in the prisoner groups occurred in the first year after liberation, for the most part in the screening hospitalizations in which the medical status of returning ex-prisoners was evaluated. Such admissions to service hospitals for screening purposes were undertaken for 95 percent

of the Pacific prisoners and 36 percent of the European prisoners. Evidence is presented to indicate that this difference in early postliberation hospital experience does not account for any substantial part of the morbidity difference between the two groups of ex-prisoners.

5. After the first year following liberation the morbidity levels of both prisoner groups fall appreciably. The subsequent trends in hospitalized morbidity are illustrated by annual admission rates to service and VA hospitals in years 2 through 6, covering the remainder of the observation period. In those years the service hospital admission rates of both Pacific and European prisoners (for men remaining in service) reach virtually the same levels as the corresponding rates of their controls. The Pacific group, however, shows annual VA hospital admission rates after separation significantly in excess of the corresponding rates for their controls, for years 2 through 5, but the rate drops appreciably in year 6. On the other hand, the VA hospital admission rates of the European prisoners and their controls are quite similar throughout the 6 years. The relative excess of VA hospitalization in the Pacific prisoners appears to be the salient general observation in the area of postliberation morbidity.

6. In the Pacific prisoners the percentage of veteran-days spent in VA hospitals is greatly in excess of the corresponding figure for the controls, after the first year following liberation. However, approximately half of the total PWJ hospital-days rate is attributable to the men hospitalized for tuberculosis. If men with tuberculosis are omitted in the rate computations for both PWJ's and WJ's, the difference between the two persists but is considerably smaller.

7. Only a limited amount of information on VA rating for disability compensation was sought: the percentage rating as of January 1953 (more than 7 years after liberation), and the diagnoses associated with total ratings of 50 percent or more. Ratings of 50-100 percent were current in 34 percent of living veterans among the PWJ's, 5 percent of the WJ's, 12 percent of PWE's and 7 percent of WE's. The mean rating of the PWJ's was 4.5 times that of the WJ's and 2.8 times that of the PWE's. With respect to men whose total ratings were 50 percent or more, the PWJ's had ratings assigned for diagnoses representing almost every category of disease, whereas relatively few categories were thus represented in any of the other groups. Of the numerous impairments rated in the PWJ's, residuals of wounds and injuries, although they appeared more frequently in that group than in any other, represented only 4.6 percent of all impairments, as compared with 57 percent in the WJ's, 56 percent in the PWE's, and 69 percent in the WE's.

8. The questionnaire response was exceptionally high, with 94 percent of located men returning the form (99 percent of living men had been located as to place of residence).

9. The principal facts learned from the questionnaire are:
- a. During the 6 years after liberation, 5 percent of the PWJ's and 8 percent of the PWE's made use of private or other non-service and non-VA hospitals.
 - b. Comparison of several items of information reported on the questionnaire with corresponding facts found in records indicated reasonably good recall and acceptable accuracy of response in general.
 - c. Virtually all PWJ's said they needed medical treatment in prison camp, but most (69 percent) received it only from fellow-prisoners who were physicians, and 7 percent received none. Of those receiving attention from enemy doctors practically all (96 percent) said the treatment was poor. Most PWE's (84 percent) claimed they needed treatment, and of these 26 percent received no treatment, 37 percent were treated by fellow-prisoner physicians, and 37 percent by enemy doctors. Of the latter about one-third felt the treatment was good, and nearly two-thirds said it was poor.
 - d. Stressful experiences during imprisonment could not be adequately covered on the questionnaire, particularly as regards duration, frequency, and severity. From the reported facts as to types of stress, it was apparent that excessive hard labor, physical punishment, and witnessing the punishment or killing of other prisoners, were much more frequent in Japanese prison camps than in German, whereas solitary confinement and enforced idleness were experienced more often in German prison camps than in Japanese.
 - e. With respect to health and work status of the respondents (as of about the beginning of 1953), the Pacific prisoners compare uniformly unfavorably with the European prisoners as to:
 - (1) Proportion in poor health.
 - (2) Proportion not working because of poor health.
 - (3) Proportion working less than 35 hours a week.
 - (4) Proportion whose health interferes with work.
 - f. As regards more or less specific forms of illness (disregarding vague symptoms), the PWJ's report more than twice as much as the PWE's.
10. The general findings of the study are discussed and certain recommendations for continued study are made, in particular the necessity for continuation of the follow-up to detect late effects or confirm early findings, and the desirability of more intensive study in certain areas.

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APPENDIX

R-4)

NATIONAL RESEARCH COUNCIL
COMMITTEE ON VETERANS MEDICAL PROBLEMS
HEALTH QUESTIONNAIRE
FORMER PRISONERS OF WAR

No. _____

1. If you are still in the service, check here
2. When were you captured? (month, year) _____
3. What was your general state of health on the day you were captured?
Please check one:
 I was not sick, injured, or wounded
 I was sick, injured, or wounded but I was able to walk
 I was not able to walk because of sickness, injury, or wounds
 Other state of health when captured. Please explain _____

4. Did you need medical treatment while you were a prisoner? Yes No
5. If "yes," please check one of the following:
 I had no medical treatment
 I was treated only by a doctor who was a fellow prisoner
 I received poor treatment from enemy doctors
 I received good treatment from enemy doctors

6. In the following list are some of the worst experiences that prisoners of war had. Did any of these apply to you while a prisoner? Please check each one that applies to you, and add, in the last item of the list, any other bad experiences you had.

- I had no bad experience while a prisoner
- I was on a death march
- I was put in solitary confinement
- I had to do an excessive amount of hard labor
- I saw other prisoners brutally punished or killed
- I was brutally punished myself
- I was forced to remain idle
- I was mistreated on a prison ship
- I did not receive enough food
- I was mistreated by fellow prisoners
- I was in prison camp during an air raid by allied bombers
- Other bad experiences. Please explain _____
- _____

7. When were you liberated or when did you escape? (month, year) _____

Check one: Liberated Escaped

8. How much weight did you lose during imprisonment? _____ pounds

9. List all your hospital admissions since liberation. For each admission, give the illness or operation, the date of admission, the number of days you were in the hospital, and the type of hospital (Army, VA, or other)

| Illness or Operation | Month and Year of Admission | Number of Days in Hospital | Type of Hospital (Army, VA, etc.) |
|----------------------|-----------------------------|----------------------------|-----------------------------------|
| (1) _____ | _____ | _____ | _____ |
| (2) _____ | _____ | _____ | _____ |
| (3) _____ | _____ | _____ | _____ |
| (4) _____ | _____ | _____ | _____ |

(If more space is needed, use last page)

10. How is your health at present?

Very good Good Fair Poor Very poor

If your health is not good, explain briefly _____

11. What kind of work do you do? _____

In what type of business or profession? _____

12. Did you work at all during the week of January 4 through 10, 1953? (Include work for pay in your own business or profession or on a farm, and work without pay in family business or farm. Do not include work about the house).

Yes No

13. If "yes," how many hours did you work during the week? Number of hours _____

14. If "no," please check one of the following:

- I have not been able to work for some time because of disability or poor health
- During the week, I was temporarily away from my regular job or business (because of illness, vacation, bad weather, temporary layoff, labor dispute, etc.)
- I was looking for work
- I was at school or college
- Other reason (please explain) _____

15. Even though you worked full time or part time during that week, did your health interfere with your work?

Yes No

If "yes," explain briefly _____

16. Date of filling in form _____

Month Day Year

17. YOUR ADDITIONAL REMARKS In the space provided below, please add any additional comments that you may have about the effects of prison camp on your health.

18. If this was sent to the wrong address, please give your correct address.

Number and Street

City or Town, Zone no., State

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