

yellow pine in northern Arizona and New Mexico. Most of the cacti in the United States are restricted to the southwestern area of late summer rains, and the same might be said of the species of *Yucca* and related genera.<sup>12</sup> (Both groups consist entirely of evergreens, and both have also several representatives in the Southeast.) The gymnosperms other than conifers (*i. e.*, Taxaceæ, Cycadaceæ, Gnetaceæ), as well as the palms and Ericaceæ, show a somewhat similar preference for late summer rain, in the United states at least.

The same precipitation factor seems to control indirectly several economic features. For example, most of the developed water-powers in the United States are within two or three hundred miles of the line of equilibrium between early and late summer rains, though this may be chiefly because the same topographic factors that make the water-power possible also influence the seasonal rainfall in some way. Some correlations between seasonal rainfall and crops are easily made. Alfalfa, wheat, figs and upland cotton are not raised much where the late summer rainfall exceeds that of early summer by more than three inches, while sugar-cane, pineapples, grape-fruit and sea-island cotton thrive where late summer rains prevail. But of course the soil has a great deal to do with this too.

It would be interesting, and comparatively easy, to determine how far the same seasonal precipitation factor can be correlated with soils, vegetation, etc., in other parts of the world. The explanation will not be quite so easy, for cause and effect are involved in a complex manner. Some of the marked soil differences between the Mississippi valley and the Atlantic coastal plain can be explained very well on geological grounds, wholly independently of modern climatic factors; and it may be that the deciduous forests and prairies that characterize the richest soils are conducive to early summer rains, and *vice versa*, in some way not yet understood.

The factor here discussed probably does not have exactly the same significance in cold as

in warm climates, in humid as in dry, or in regions of wet winters and dry summers, like the Pacific coast, as in regions with wet summers, like Florida. All this deserves further investigation; and it may be found that by shifting a little the periods compared more significant results can be obtained.<sup>13</sup>

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#### PLANS FOR THE PHYSICAL RECONSTRUCTION OF DISABLED SOLDIERS<sup>1</sup>

THE Surgeon-General, with the approval of the General Staff, announces the completion of plans for the physical reconstruction of disabled soldiers in the general military hospitals. These plans are formulated with a view to close cooperation with the War Department committee on education and special service in the work of restoring men to full or limited military service, and with the Federal Board for Vocational Education, which is authorized by the law to provide vocational training for disabled men after their discharge from the army and navy.

The records of 516 cases treated in four hospitals shows 134 men able to return to full military duty, 210 fit for limited service, and 172 who are eligible for discharge. In the last group 12 are classed as helpless or institutional cases; 121 are able to return to their former occupations; and 39 will need further training to fit them for earning a livelihood. These figures show the division of responsibility in the work of reconstruction.

The task of fitting men for further military service is at present the most pressing need because wherever an able-bodied man behind the lines can be replaced by one less fit physically, but vocationally capable, a soldier is gained for active duty. The reconstruction work in the hospitals, therefore, will emphasize tech-

<sup>13</sup> The interested reader would do well to consult Professor R. DeC. Ward's paper on rainfall types of the United States, in the *Geographical Review* for August, 1917, and some of the earlier literature referred to therein and in the two pages following it.

<sup>1</sup> Publication authorized by the War Department.

<sup>12</sup> See Plate 99 in the 13th Annual Report of the Missouri Botanical Garden, 1902.

nical training in all lines capable of adaptation to the physical limitations of disabled men and in which employment will act as a therapeutic agent. When play and work and study will help a man to get well, this kind of medicine will be prescribed to the patient. If the work he does leads to further service in the army or to better prospects in civilian life so much the better.

The Surgeon-General has designated the following general military hospitals for the work of physical reconstruction:

Walter Reed General Hospital, Washington, D. C.

General Hospital No. 2, Fort McHenry, Md.

General Hospital No. 3, Colonia, N. J.

General Hospital No. 6, Fort McPherson, Ga.

General Hospital No. 7, Roland Park, Baltimore (for the blind).

General Hospital No. 8, Otisville, N. Y.

General Hospital No. 4, Fort Porter, N. Y.

General Hospital No. 9, Lakewood, N. J.

General Hospital No. 11, Cape May, N. J.

General Hospital No. 16, New Haven, Conn.

General Hospital No. 17, Markleton, Pa.

Letterman General Hospital, San Francisco, Calif.

United States Army Hospital, Fort Des Moines, Iowa.

Plattsburg Barracks Hospital, Plattsburg Barracks, N. Y.

General Hospital, Fort Bayard, N. Mex.

The policy to be followed in these hospitals, as announced by the Surgeon General, is that hereafter no member of the military service disabled in line of duty, even though not expected to return to duty, will be discharged from service until he shall have attained complete recovery or as complete recovery as may be expected when the nature of his disability is considered. In furtherance of this policy, physical reconstruction is defined as complete mental and surgical treatment carried to the point of maximum functional restoration, both mental and physical. To secure this result all methods recognized by modern medicine as conducive to cure will be utilized. In other words, not only the ordinary means of medicine and surgery, including all specialties, will be utilized, but also physical measures such

as are employed under physiotherapy, including hydro, electro and mechanotherapy, active exercises, indoor and outdoor games and passive exercise in the form of massage. Provision in the form of adequate buildings and equipment for physiotherapy have been adopted in each of the hospitals.

Modern medicinal treatment does not end with physical cure. Functional restoration is the final aim of the modern physicians and surgeons. It is conceded that the physical rehabilitation of disabled men is peculiarly dependent upon their mental attitude. The more serious the disability, the greater the danger of mental depression and an indisposition to respond to medical and surgical treatment. The educational work should begin, therefore, at the moment when the man has arrived at the stage where he begins to worry about his future, whether in this country or overseas. The first problem is to divert his attention by simple recreation, through reading, pictures, games, handiwork occupations, and the like, with a view to securing a genuine interest in the attainment of some worthy end—the end most certain to hold his attention and to claim his best efforts in his future vocation. Hence, by gradual steps he may be induced to supplement his previous vocational experience by academic, scientific or technical instruction, or to choose a new vocation and begin preparation for it if such a course is necessary.

The need of “cheer-up” work in the hospitals extends to all who are mentally capable of planning for their own future. This means a relatively large proportion of the entire number. The beginning is made at the bedside with handicrafts of various kinds grouped under the term “occupational therapy.” When the man is able to leave the ward and can be benefited physically by technical training, he has the opportunity of working at specific trades either in the curative workshop, in specially provided classrooms, or out of doors.

The teachers for this work have been secured from the convalescent disabled soldiers who are already skilled in their vocations and from the enlisted personnel of the army secured by transfer or by induction of regis-

trants disqualified for general military service but qualified for special limited service. These instructors work under the direction of educational officers chosen for their professional standing in civil life and commissioned in the Sanitary Corps of the Medical Department. The General Staff has just authorized commissions for 119 educational officers for this purpose.

From the military standpoint disabled soldiers may be placed in three general classes: (a) Those who can be restored to full duty. (b) Those who can be fitted for limited service. (c) Those disabled to the extent of unfitting them for further military service.

It is the announced policy of the Surgeon-General that patients of the first class (a) should have, when circumstances warrant it, the benefit of therapeutic treatment through play, work, and study, as may be prescribed by medical officers, in order that their morale may be stiffened, their special skills improved, their future usefulness increased and their recovery hastened.

Patients of the second class (b) should have, whenever conditions permit and the medical officers approve, such specific training—physical and vocational—as will in the judgment of the educational officers best fit such patients for limited service of a particular kind. At present patients are being trained in general hospitals for limited service as general and vocational teachers, typists, printers, tailors, cobblers, harness makers, welders, motor mechanics, painters, machine workers, woodworkers, bookkeepers, statisticians, telegraphers, photographers, telephone operators, cooks, storekeepers, electricians, etc.

The list will be extended with the advice and cooperation of the committee on education and special service of the War Department to meet other needs as they arise. In connection with the large general hospitals there is abundant opportunity for practise in many trades and occupations. At Fort McPherson, for example, practical experience can be gained in twenty different trades. Moreover, there is immediately adjacent to the hospital a large quartermaster's mechanical repair shop, cover-

ing all phases of mechanical repair and construction to which men can be assigned for limited service or to gain experience.

Patients of the third class (c) should be encouraged in every possible way to accept the benefits accorded them for vocational training by the Federal Board for Vocational Education. To this end they should have while in the hospital such physical training and general education as will best promote their physical reconstruction and at the same time contribute most to their vocational training. Patients who do not elect or who are not eligible to continue their education under the Federal board should receive such training as the medical and educational officers deem best in each individual case.

#### GEORGE ARCHIBALD CLARK

PROFESSOR GEORGE ARCHIBALD CLARK, academic secretary of Stanford University, died on April 27, 1918, at his home on the campus of the university, after a prolonged illness from a disease that had baffled his physicians. Mr. Clark's illness began more than a year ago with an attack of grip from which he never fully recovered. His legs became so weakened or paralyzed that he was for some time able to walk only with the aid of a cane, and later scarcely at all. He continued to go to his office until last August, and after he was no longer able to do so he continued to look after business matters from his home. His work as academic secretary was hard and exacting and of such a nature that many of the details could not be entrusted to his assistants. This close confinement and constant attention to official duties doubtless had much to do with bringing on the fatal illness.

Mr. Clark was fifty-three years old. He graduated at the University of Minnesota in 1891. In the fall of that year he went to California and registered as a graduate student in Latin at Stanford University which was then just entering upon its first year. Being an expert in shorthand, Mr. Clark was offered a position as stenographer in the university. In 1896 he was made secretary to President Jordan. His unusual ability soon