

can be hired. When you hire or enslave a man you secure only mechanical service. The world's work can not be done by hired muscle alone, but requires personal interest, moral character and entire manhood. Slaves survive in their pyramids, their temples and their papyri, where their masters have perished. The successful and progressive civilizations of to-day are founded on the freedom and self-satisfaction of the individual. The most acute problems of modern society arise out of the hiring of men to do work which they would much prefer to do for themselves and would do better for themselves. These things bear their lessons for universities, if we will heed them. Freedom of speech and complete self-government are necessary to the best interests of a university. A whole staff is together more capable than any one man. Suppression of staff members who speak without authority of the head is the suppression of truth and initiative. It has resulted and must result in the selection of weak men for the faculty and in narrowness, bigotry and provincialism in the institution. Self-government will draw strong men into the faculty, will stimulate initiative, will make possible and encourage progressive administration, and will bring to mental endeavor on the part of both student and teacher the freshness of the morning air, the pursuit of a goal of one's own choosing, and satisfaction in the achievement of one's ideals.

J. B. JOHNSTON

UNIVERSITY OF MINNESOTA

THE FUR-SEAL CENSUS FOR 1913

IN the summer of 1912, for the first time, a complete enumeration of the breeding stock of the fur-seal herd of the Pribilof Islands was made. Prior to that season estimates of the herd were based upon a full count of harems, to which an average harem, obtained by counting individual animals upon a part of the

breeding ground, was applied. The rookeries counted were naturally the smaller and more scattered ones and the average harem derived from them did not fairly represent the larger rookeries. The importance of the annual estimates, however, lay in the measure of decline which they afforded, and for this purpose they were as useful as exact counts would have been.

The treaty of July 7, 1911, suspended pelagic sealing, the cause of the herd's decline, and it was natural to expect a cessation of decline and the beginning of growth toward recovery. The exact condition of the breeding stock at its lowest point became, therefore, in 1912, a consideration of the greatest importance. A count of all the breeding families, which was in effect a count of the breeding males, was easily made, but the females come and go in the sea and are never all on the land at one time. They furthermore could not be counted accurately, if they were all present, as they can not be herded or driven. Their direct enumeration, therefore, is an impracticable thing. The young pups, however, are timid of the water during the first month or six weeks of their lives and do not go into it. After the breeding season is over, that is, early in August, the mothers can be driven off and the young herded and handled like sheep. As each pup represents a mother, the problem became merely one of counting all the pups. This was accomplished and an account of the work for 1912 was given in the December 27 issue of SCIENCE.

As the census of 1912 was important to give exact information regarding the breeding stock at its lowest point, so a repetition of this census in 1913 became important to establish a measure of increase or expansion in this breeding stock. The total number of pups found in 1912 was 81,984. For the season of 1913 the total was 92,269, a gain of 12½ per cent. The normal annual gain of the herd arises from the accession of young three-year-old females coming upon the rookeries each season to bear their first pups. The theoretical rate of gain, as deduced from the quota of three-year-old males, taken in recent years,

should be about 25 per cent. The breeding life of the female is about 10 years. Approximately 10 per cent. of the adult stock of females disappear in each winter migration through natural termination of life, and the net gain of the herd should be about 15 per cent. That the gain of 1912 is $12\frac{1}{2}$ per cent. instead of 15 is explained by the fact that the increment of three-year-old females for the past season was derived from the birthrate of 1910, when pelagic sealing was still in operation and pups in considerable numbers died unborn with their mothers or starved to death on the rookeries later because of the death of their mothers. In short the season of 1913 has not been quite normal. The season of 1914 should show normal conditions because its increment of gain will come from the birthrate of 1911, the first season under exemption from pelagic sealing. If the count of pups is repeated for that season, the normal rate of gain will be established.

All elements in the fur-seal census can not be measured by counts. The bachelor seals of four years and under, and the young females of two years and under, come and go from the sea in an irregular fashion which makes counting impossible. A basis of reasonably accurate estimate for these classes of animals, however, rests in the data arising from the quota of killable seals, and counts of animals rejected at the killings as too small or too large. Utilizing this form of estimate to supplement the counts of bulls, cows and pups, the appended completed census of the fur-seal herd is obtained, the figures for both 1912 and 1913 being given for purposes of comparison.

The stock of breeding and reserve bulls in 1913 shows an increase adequate to meet the needs of the expanding herd. The relation of the two sexes on the breeding grounds has in this season been more nearly ideal than at any time in the past 17 years. Could present conditions remain undisturbed, accurate information regarding the herd's future condition would be certain. Unfortunately this is not to be. The suspension of land killing, incorporated in the law of August 24, 1912, will

break the present equilibrium and throw all factors of the problem into new confusion, by swamping the breeding grounds with an overstock of idle bulls. The real effect of the suspension is not at present visible, except in that the hauling grounds were in 1913 filled with superfluous young males, the killing of which was prevented by law. Ten thousand of these

FUR SEAL CENSUS

Class of Animals	Basis of Enumeration	1912	1913
Breeding bulls	Count	1,358	1,403
Breeding cows	Count	81,984	92,269
Reserve bulls—young	Count	199	259
Reserve bulls—adult	Count	113	105
Pups	Count	81,984	92,269
Bachelors—4-year-olds	Count and estimate	100	2,000
Bachelors—3-year-olds	Count and estimate	2,000	10,000
Bachelors—2-year-olds	Count and estimate	11,000	15,000
Bachelors—1-year-olds	Estimate	13,000	20,000
Young cows—2-year-olds	Estimate	11,000	15,000
Young cows—1-year-olds	Estimate	13,000	20,000
Totals		215,738	268,305

animals (with skins worth \$350,000 to \$400,000), were left to grow up as useless fighting bulls, and this condition is to be multiplied through four more seasons. Its consequences ten years hence will prove a veritable calamity to the herd.

Leaving aside this discouraging feature of the situation, however, it is a source of genuine gratification that the suspension of pelagic sealing, accomplished by the treaty of 1911, has been so immediate and salutary in its effect. Not merely has the decline on the Pribilof Island rookeries—persistent through 30 years—been stayed, but the breeding herd has taken on a rapid growth. Its initial stock of 92,000 breeding females makes a splendid nucleus and will compound at an annual rate of 15 per cent.

GEORGE ARCHIBALD CLARK

STANFORD UNIVERSITY, CAL.,
November 29, 1913