

that, after the disorganization created by World War I, achieved teamwork by administration and regents by means of the academic senate, with its advisory committees on budget, on research, and especially on faculty appointments.

It is true that after Osterhout, Taylor, and Loeb left, the faculty was strengthened by the acquisition of G. N. Lewis. His influence was indeed great, but that would have been to no avail without the strong support of the existing faculty and the outstanding organizing ability of one of the truly great presidents of the university, the astronomer W. W. Campbell, who followed Wheeler after an interlude of three or four years and was president from 1923 until 1930; he is not mentioned by Walsh. Campbell was appointed with the approval of the academic senate and the faculty and did as much to start the university on its upward path as any other president. In this he was ably aided by the astronomer A. O. Leuschner, whose influence was fully as great and in many ways less erratic than that of G. N. Lewis. It was as a result of the efforts of the physicist E. P. Lewis and of Leuschner that Birge and other active founders of the physics department were brought to Berkeley. It was Campbell, not Sproul, who brought Ernest O. Lawrence to Berkeley.

Probably most of the important decisions that led to the later trends of the university's growth were made by Campbell. It was under Campbell that the decision was made to open a branch at Los Angeles in response to southern political pressure. It was Campbell who built up the strong scientific departments at Berkeley and U.C.L.A. Campbell strongly supported the Scripps Institute of Oceanography. Under Campbell the visiting lectureships instituted by Wheeler were resumed. Campbell also strongly supported the board of research and utilized the senate committee set up before his advent. He added institutes of advanced study and broadened the fields of study in the university.

Thus when Sproul took over the presidency in 1930, the university was well organized internally and had a scientific faculty destined to lead to the eminence that the university has now achieved. This does not in the least belittle the great contributions made by President Sproul, who faced entirely different and, in a sense, more trying problems. He inherited an al-

ready potentially famous institution from Campbell and furthered its continued growth. Above all, he kept a single, unified state university going and growing over the most serious political opposition of pressure groups.

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Leadership in Macaque Societies

The word "leader" has a clearcut meaning in common English: one who leads or precedes another individual or a group and thus determines the direction of movement of the pair or larger group.

All accounts agree that the males in societies of the various macaque species are organized into a definite dominance hierarchy which regulates social distance and relative location of members of a group. As a group moves on ordinary occasions, the most dominant male is found near the center, immediately surrounded by females and immature animals, and with subordinate males spaced out around him at a longer distance. Those that take the lead are the subordinate males, or, occasionally, an old female.

The dominant male may take the lead on rare occasions, as when he attempts the rescue of a captured infant and is followed by the band (1). Occasionally, he may take a different direction from that of the preceding animals, in which case they retreat and get out in front again. When there is a conflict between groups, he maintains his central position.

To speak of this animal as "the leader" and the subordinate males as "subleaders" (1, 2) is to give a misleading picture of social organization. Such an animal is definitely the alpha male in the dominance hierarchy, a general relationship, but his role in the leader-follower relationships of the band is much more special. He exercises some control over the movement of the band, and in special cases may take the lead, but in most cases the group is led by others.

Leader-follower relationships within the band should be analyzed with the same care and detail as the dominance-subordination relationships in order to obtain a true picture of social organization. Present evidence indicates that leader-follower organization is less definite and more complicated

than dominance organization. If a term is desired to describe the total role of the central male, it should be one which is either neutral in meaning or which is accurately descriptive. In any case, it should not have anthropomorphic connotations.

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References

1. G. B. Koford, in *Primate Social Behavior*, C. H. Southwick, Ed. (Van Nostrand, New York, 1962).
2. D. Miyadi, *Science* 143, 783 (1964).

Great Men

Sir Gavin de Beer's tribute to George Gaylord Simpson in your issue of 20 March (Book Reviews, p. 1311) is a cause of deep gratification to me, as it must be to many others. In justice, however, to the memory of another great man referred to in that review, William Bateson, with whom I had the honor of working briefly in 1922, it seems only fair to quote from his memorable address to the American Association for the Advancement of Science, in Toronto, December 1921 [*Science* 55, 57 (1922)], acknowledging the consequences of his visit to Morgan's laboratory at Columbia. [De Beer said in his review, "The 1920's were a bewildering period for biologists. A year after the publication of T. H. Morgan's cast-iron proof that genes are carried in linear order on the chromosomes, I remember arguing with W. Bateson, who refused to accept it. . . ."]

. . . For the doubts—which I trust may be pardoned in one who had never seen the marvels of cytology, save as through a glass darkly—can not as regards the main thesis of the *Drosophila* workers, be any longer maintained. The arguments of Morgan and his colleagues, and especially the demonstrations of Bridges, must allay all scepticism as to the direct association of particular chromosomes with particular features of the zygote. The transferable characters borne by the gametes have been successfully referred to the visible details of nuclear configuration.

The traces of order in variation and heredity which so lately seemed paradoxical curiosities have led step by step to this beautiful discovery. I come at this Christmas Season to lay my respectful homage before the stars that have arisen in the West.

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