

degree, each aiming to present a different point of view or a novel method of attacking evolutionary problems. Darwin might in that case have lived to see his pupils holding numerous professorships in widely scattered schools to the glory and delight of his university; the grateful pupils might even have honored him with a Festschrift on forty different and wholly unrelated subjects—but the world would still hold the theory of special creation!

Our universities need carefully to consider whether they are really *fostering research* in multiplying "research courses" in their graduate schools and making larger and larger bids for graduate students. In the interest of genuine research within the universities it is important that they with their estimated hundred millions annual income should not absorb the exclusively research institutions with their paltry two millions estimated annual income. It is important that the latter type of institution should persist, if only to point out the difference between giving all one's time to research and giving all one's time to training for research those who either are incapable of it or are never going to have time for it themselves, but will only repeat the endless process of getting others ready for it.

But it has been objected and will be objected again—If the university does not foster incipient research by training beginners, there will soon be no trained investigators. Is this true? Is it true, I wonder, in the case of astronomy, the oldest of sciences, the one which is almost never used as a stepping stone to the doctorate in a graduate school? Is there a dearth of workers there, of adequately trained and competent ones? Astronomy has certainly not ceased to advance in our time.

Should the university then abandon research? By no means, but it should cease to deceive itself as to what research is. It is not offering "Courses in Research" or conferring doctorates or publishing numerous papers or even building laboratories.

Many of our universities already have attached to them genuine research establishments which are making important contributions to knowledge. As a rule they receive no students

and confer no degrees. They are invariably endowed; otherwise they would sooner or later be dragged into the whirlpool of teaching and forced to offer courses and degrees as bait to prospective students and would thus be turned aside from intensive and effective investigation. Some such establishments, however, have other functions which interfere more or less with investigation, such as exhibition and demonstration in museums and gardens.

The university is an entirely suitable place, in many respects the *best* place, for a research establishment; but when such establishments are founded in connection with a university, their purpose *for research* should be made very clear and their administration should be kept very distinct from both teaching and the demonstration of discoveries to the public.

W. E. CASTLE

August 25, 1914

#### CHONTAL, SERI AND YUMAN

A RECENT reexamination of the available evidence bearing on Brinton's old but not generally accepted finding of a genetic relationship between the Chontal (Tequistlatecan), Seri and Yuman Indian languages, confirms his judgment positively. Chontal and Seri being Yuman, are Hokan; and the Hokan family therefore now has a known extent of over 2,000 miles on the Pacific coast of America. So definite are the resemblances furnished by Chontal and Seri that they help to elucidate problems in the Hokan languages of northern California. The results of the study are now awaiting publication.

A. L. KROEBER

September 8, 1914

#### SCIENTIFIC BOOKS

*The Microscopy of Drinking Water.* By GEORGE CHANDLER WHIPPLE, Gordon McKay Professor of Sanitary Engineering, Harvard University and Massachusetts Institute of Technology. Third edition, rewritten and enlarged. New York, John Wiley & Sons. 1914. xxi + 405.

The scientific study of the microscopical organisms in their relation to potable waters