incorporated as an independent and non-profit foundation, will be a corporation working in close harmony with the university but managed by a board of eleven trustees. Under the incorporation the foundation will be able to receive all types of bequests, gifts, assignments of patents, royalties, etc. It will be a business corporation so far as contracts, trust agreements, licenses and buying and selling are concerned.

*The News Edition* of the American Chemical Society states that the National Aniline and Chemical Company, a subsidiary of Allied Chemical and Dye Corporation, New York, is being merged with the parent company. Its business will be conducted as the National Aniline and Chemical Division of the Allied Chemical and Dye Corporation. B. A. Ludwig, president of National Aniline, and E. W. Clark, president of the Barrett Company, another subsidiary, have been appointed vice-presidents of Allied Chemical and Dye Corporation.

THE RCA electron microscope has been adjudged the winner in a Products Design contest entered by hundreds of American manufacturers which was conducted by *Electrical Manufacturing* on the grounds of its basic design and its outstanding external appearance, and a descriptive "Award Paper" prepared by Theodore A. Smith, of the RCA Engineering Products Division.

IT is reported in *The British Medical Journal* that at the suggestion of Dr. G. Jedlewski, medical adviser to M. Raczkiewicz, the Polish President, a special medical board has been formed in London to prepare plans for fighting epidemics which may break out in Poland at the end of the war, and thus to prevent the spread of infectious disease to Western Europe and Great Britain. The board, acting in conjunction with the Ministry of Health, will also collect medical supplies so that immediate help may be ready at the end of the war.

A UNITED PRESS dispatch from Berlin dated December 3 reads: "Reports from Berlin said that the University of Brussels had begun a sit-down strike against German occupation authorities and that the Germans had served an ultimatum ordering the faculty to reopen the school to-morrow 'or take the consequences.' The trouble, according to the *Brusseler Zeitung,* began when the Germans ordered eighteen Flemish professors put on the staff, which had been entirely French. University authorities objected to three of the Germans' candidates, one of whom the newspaper described as 'a Flemish activist in the World War period.' The other two were said to be strongly pro-German."

IT is stated in *The New York Times* that filming of a documentary motion picture on nutrition has been started in Hollywood under the sponsorship of Paul V. McNutt, Federal Security Administrator. The film is a project of the Office of Defense Health and Welfare Services and is being produced by the American Film Center which is supported by the Rockefeller Foundation.

A GRANT of $50,000 has been made by the Commonwealth Fund to the American Bureau for Medical Aid to China, for the support of the Emergency Medical Service Training School in Kweiyang, China.

# DISCUSSION

## THE ROLE OF THE BURROWING OWL AND THE STICKTIGHT FLEA IN THE SPREAD OF PLAGUE

DURING the spring and summer of 1941 a study was made of a plague epizootic then in progress among the ground squirrels (*Citellus beecheyi*) to the east and south of Bakersfield, Kern County, California. Proof of the identity of the disease was obtained by the isolation of *Pasteurella pestis* from the tissues of infected squirrels as well as from various species of flea found on the rodent hosts. From an epidemiological point of view the possible methods of spread of the disease are of particular interest, and in this connection the following sequence of facts is considered worthy of special notice.

(1) In this epizootic, which was discovered by a survey crew of the California State Department of Public Health, the first squirrel to be proven plague-infected was obtained on April 29, 1941, on the El Tejon ranch, at a spot about twelve miles due east of Wheeler Ridge. The outbreak was evidently nearing the close of its active phase in this area, for no infected animals were found here after May 1, but the infection appeared to linger on in the flea population, for fleas obtained from squirrels as late as May 15 still had living plague organisms in their digestive tracts.

(2) Among the fleas collected from ground squirrels in near-by areas were specimens of the sticktight flea (*Echidnophaga gallinacea*), a species of extremely wide geographical and hostal occurrence in the United States. It is found abundantly on chickens and other domestic fowl, on rats and various wild rodents, and on such predators as the coyote, Cooper's hawk and burrowing owl.[1, 2] The last-men-

[1] I. Fox, "Fleas of Eastern United States," Iowa State College Press, Ames, Iowa, 11–12, 1940.

tioned of these hosts, the burrowing owl (*Speotyto cunicularia*), was seen frequently at low altitudes in areas where the plague epizootic was in force. The association of burrowing owls with colonies of ground squirrels is a well-known fact, and the obvious possibilities of contact between them need hardly be mentioned.

(3) On June 28, 1941, a specimen of the burrowing owl taken on the El Tejon ranch about five miles west of the plague area yielded 70 individuals of *E. gallinacea*, which upon mass-inoculation into a test guinea pig proved to be infected with plague organisms. A post-mortem examination of the owl could not be made at the time, but the possibility that this bird was the source of infection for these particular fleas seems remote, as it is generally agreed that birds are not susceptible to plague. This is apparently the first record of a bird host as a carrier of plague-infected parasites, and the first demonstration of natural plague infection in this species of flea. Experiments are now in progress to determine the vector efficiency[3] of this flea.

As long ago as 1909 Rucker[4] suggested that the burrowing owl might play an important part in the dissemination of plague as a carrier of infected fleas, but his remarks were not supported by any direct evidence. More recently Jellison[5] has discussed the rôle of predatory birds in the spread of plague and has shown that rodent fleas of various species are frequently transported on freshly killed hosts to the nests; however, in no instance was the presence of plague established. The fact that plague has now been isolated from a species of flea common to both rodent and bird hosts, and from specimens actually obtained from a bird, finally lends supportive evidence to an old theory and adds another complicating factor to the epidemiology of plague.

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## THE TERM "EUTHENICS"

WHEN the charter for the establishment of the Iowa Child Welfare Research Station was prepared, I was in favor of using the term "euthenics," defined in Webster's dictionary as "the science having to do with the betterment of living conditions to secure more efficient human beings," as a term coordinate with the term "eugenics." In common language, eugenics would then denote the science and art of being well born, and euthenics the science and art of living well or wise living. This would have been very appropriate, but at that time we had to win the popular approval of the legislature and the people of the state so we fell back on the easily understood term "child welfare" and gave it a new connotation by centering it upon scientific research. Now that child welfare or child development is a well-established movement, both theoretical and practical, I would again advocate the use of the single technical word euthenics to denote scientific procedures within this great area.

We may speak appropriately of the science of euthenics or the art of euthenics depending upon the point of view. In the former case, the question arises as to whether there is or can be such a science of well-being. We immediately recognize that practically all the sciences contribute to this subject, as in medicine, engineering, economics, psychology, physiology, sociology and education. The question then arises: Can the salient interests and contributions from each of the sciences be selected and coordinated into a specific applied science? Likewise we may ask: Can we recognize a definable and significant area to be designated as the art of well-being? It is well recognized that such applied arts as education, sociology and mental and physical, individual and social hygiene center about this issue. The question then arises: Can the salient interests and contributions from all such sources be selected and coordinated into a specific applied art? On both of these issues, the time would now seem ripe to recognize an affirmative answer.

In other fields the term "psychology" is made to function, as in the psychology of music, the psychology of art, the psychology of speech, the psychology of dramatics, the psychology of athletics or the psychology of advertising. This terminology is justified on the ground that it is the function of psychology as a science of experience and behavior to select, integrate, organize and foster interests developed in all other sciences pertaining to the subject and to take the initiative for the conduct of research within these specific fields of applied science. The term "psychology of music" has the advantage of having made the best contacts with musical education and other musical enterprises. Within one year four textbooks under the same title, "The Psychology of Music" were published. That term has gained full recognition as a coordinator of all the scientific approaches to the

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[2] M. A. Stewart, *Jour. Econ. Entom.*, 25: 165, 1932.
[3] C. M. Wheeler and J. R. Douglas, *Proceedings, Soc. Exp. Biol. and Med.*, 47: 65–66, 1941.
[4] W. C. Rucker, *U. S. Public Health Reports*, 24: 1225–1238, 1909.
[5] W. L. Jellison, *U. S. Public Health Reports*, 54: 792–798, 1939.