

PART II
SYSTEMATIC CLASSIFICATION

A PRELIMINARY WORD ABOUT PART II

In the following pages, bibliography will be brought to a minimum and the economy and biology of the flea will be expanded instead. The reason for this move is simple. During 1942 Jellison and Good issued their large work "Index to the Literature of the Siphonaptera of North America," *National Institute of Health Bulletin* No. 178, which is available to anyone who wishes to send to the Superintendent of Documents, Washington, D. C. The price is 25 cents. This is a book in itself, and very thorough. In the following pages, for the most part, only such bibliography will be offered as has been built up since the closing date of the work of Jellison and Good; that is, since July of 1939.

The illustrations in this volume are all the original work of the writer. As many as possible were drawn from types or paratypes, and such a note is made on the plate. All drawings were made with camera lucida, and therefore all parts of any individual illustration are in proportion, but they may not be in proportion with other individual illustrations. In practically all instances the parts of the male modified abdominal segments have been separated. Many flea illustrations are built with these parts intoto, but such an arrangement makes all the parts so small that frequently their value is entirely lost. The writer features in most cases the male finger and process generally together, but occasionally separated, the VIII and IX Sternites, and in some cases other parts. In the female some authors have included the armature on the VII Sternite but in so few cases does this armature come into importance that the writer has included these bristles only where they have taxonomic value. While many writers have not found it necessary to include good concise illustrations of the spermatheca, this writer feels this organ is of importance enough to give it special treatment so in the majority of fleas he has drawn it separate and enlarged. Some describers have failed to illustrate their descriptions of fleas. In cases where the describer has failed to include illustrations and the writer has been unable to obtain the specimens to illustrate them, a blank is left in the plate, to be filled in as the material becomes available to the student.

The numbering system is in no way involved. The Arabic numerals 1 to 236 are the reference numbers of those species and subspecies which are found in the West.

Recording the range or distribution of fleas can be only as conclusive as the research and collecting upon which the recording is based. For the most part, the writer has assumed that if a flea is found in one

locality and then in another some distance away, it will surely be found in between, provided, of course, that its true host is found throughout that distance. For example, *Meringis cummingi* was described from Los Angeles, California, in 1926 off a kangaroo rat; 12 years later the writer took it off kangaroo rats 1,000 miles to the north at Klamath Falls, Oregon. There were no records of discoveries in between, but in 1940 Stewart took this flea off kangaroo rats at Jamesburg, Monterey County, California. So, as more collecting is done the gaps between the records close to complete the range record.

Seasonal distribution can only be charted for fleas by constant trappings of the hosts which they infest through the entire year. In high elevations this generally becomes impossible because of the deep blankets of snow. We know little of the winter fleas of the high mountain dwellers, such as conies. Nothing is known about the fleas which infest estivating and hibernating animals or whether fleas actually attack hosts during these periods of sleep.

The biology of the flea is practically an unexplored field. Under this heading the writer merely touches upon such items as the egg laying season, their numbers and shape, life history, life cycle and habits of the flea.

The medical importance of the flea varies from its being purely a nuisance to its provoking flea allergy, plague, tularemia and typhus.