There is given a brief general statement regarding the families to which these belong and the more or less convenient groups into which the authors divide some of the families. There is also of each species an account, which, while it does not go into technical details, gives habits, measurements, and geographic distribution, though usually not a complete description of adult plumages. While no attempt is made to provide a full life history, the material given throws much interesting light on the birds treated, and in some cases is considerably extended. The text is made up in large part of original life history observations of birds in the field and in captivity, and for this reason the accounts of the various species differ much in length, according to the opportunities of the authors.

Much exceedingly interesting information is given on the song, notes, nesting habits, the young, and the general behavior of the different birds. In the exactness of the data presented, the text gives excellent evidence of the care with which the observations have been made. Of particular value are the notes on the development of nestling birds, with specific data on the age of each stage of plumage, information which every one who has had occasion to search for realizes is difficult to obtain, and furthermore, all too rare in books on birds. Dr. Heinroth has for a great many years been able to rear large numbers of birds in captivity, and this has given him an unexampled opportunity to determine many facts which would easily escape the chance observer in the field, but which are of great importance, nevertheless. Some of the longer accounts of the life history of the species treated are especially good and amount almost to a monograph of the behavior of the species. Worthy of particular mention are those of the nightingales (*Luscinia megarhyncha* and *Luscinia luscinia*), the blackbird (*Turdus merula*), the spotted flycatcher (*Muscicapa striata*), the robin (*Erithacus rubecula*) and the swallow (*Hirundo rustica*). The book is not a technical treatise, but is designed to present an interesting side of the life history of the birds of the author's region.

One of the most important features of "Die Vögel Mitteleuropas" is the wealth of illustration. The numerous plates are, however, issued apparently as material was obtained for their completion, or as convenience dictated, since but in few instances do they illustrate the species described in the parts in which they appear. Both the colored and the uncolored plates are made up with the idea of showing the development of the species figured, from the egg through the nestling and juvenal plumages up to that of the adult. The value of these plates is greatly enhanced by the circumstance that they represent the various stages of plumage at precisely known ages of the birds, in this admirably supplementing the descriptions given in the text.

If the standard already set in the parts now discussed should be maintained, as we have every reason to believe it will be in the parts yet to be published, we are probably not saying too much when we predict that this work will prove to be one of the most important contributions to the life history and behavior of European birds that has appeared in many years.

HARRY C. OBERHOLSER

SPECIAL ARTICLES

THE FIBRILLAR STRUCTURE OF THE DENTAL ENAMEL MATRIX OF THE GUINEA PIG

RECENTLY we[1] have outlined certain morphological findings with regard to the organic matrix of guinea pig dental enamel. Preparations were made from material carefully decalcified through celloidin. By such a method, sections of this structure may be demonstrated.

Carter[2] has claimed that in the formation of enamel, globular material is laid down irregularly and "that there is no sign of any merging of the cells into the secretion such as one would find did the ameloblasts themselves become transformed into a stroma which became incorporated into the enamel." Our sections show that protoplasmic processes may extend from the ameloblastic layer into the enamel structure. These taper away to a point within a distance of from ten to fifteen microns. Thus, there is in the guinea pig a definite articulation between these two elements, as shown by Van Giesen stain.

Moreover, when the matrix is drawn away from the ameloblasts by the pull of the microtome knife, the organic matrix may split or tear. This rupture, however, is in a plane parallel to the length of the enamel rods. Fibril-like structures thus are formed. This result is produced likewise when the direction of tension does not coincide with the length of the enamel rods but lies at an angle with them. We have photomicrographic evidence of these observations.

These results tend to show that a protoplasmic fibrillar structure may connect the ameloblastic layer with enamel matrix in the guinea pig and that the matrix itself appears to be of fibrillar structure. Thus, we do not coincide with the belief that the formation of dental enamel is an irregular deposition of precipitated material. Rather, precipitation of calcareous

[1] Beckwith, T. D., and Williams, A., Proc. Soc. Exp. Biol. and Med., 1926, 24, 76.

[2] Carter, J. T., *Quart. Journ. Micros. Soc.*, 1918–19, 63, N.S., 387.

compounds to form enamel takes place within an orderly manner in a tubular structure of fibrillar composition.

T. D. BECKWITH
ADRIENNE WILLIAMS
DEPARTMENT OF BACTERIOLOGY,
UNIVERSITY OF CALIFORNIA

ALFALFA SEED MADE PERMEABLE BY HEAT

A SERIES of experiments with alfalfa seed carried on since June, 1926, shows that moderate heat will change the permeability in a short time.

Practically all lots of alfalfa seed, both machine and hand threshed, show some impermeable seed. The amount of such seed in machine-threshed lots varies from 5 to 65 per cent. and in hand-threshed lots from 20 to 100 per cent. Various methods have been devised by other workers for treating alfalfa seed to cause the impermeable ones to germinate at once, but most of these methods are immediately injurious to the permeable seed and some are harmful to both permeable and impermeable seed. Further, such treatments injure the keeping quality of the seed.

The writer's experience during fifteen years shows that most impermeable alfalfa seeds will become permeable in storage in four years and that seeds that do not change in three years remain practically unchanged for at least three years more. However, the permeable seeds of alfalfa are comparatively short lived, so that the germination of originally impermeable seeds does not compensate for the death of originally permeable seeds unless the sample when fresh contains 40 per cent. or more of impermeable seed.

By the action of moderate heat this change can be brought about in a few hours. Hand-threshed seed which originally had 80 per cent. impermeable seeds, had after treating with dry heat at 45° C. for one hour only 53 per cent. of impermeable seed, while the average of a large number of machine-threshed samples showed that two hours at 60° C. dry heat increases the permeable seed from 65 to 92 per cent. without reducing the percentage of live seed. Similar reduction of impermeable seed resulted from considerably higher temperatures for even longer time without appreciable reduction in the percentage of live seed. Temperatures below 50° C. have little effect on the impermeable seed, even when continued for eight hours. The best results so far have been secured at 75° C. for periods varying from three to six and one half hours. The highest test gave a germination of 94 per cent., hard seed 5 per cent. with treatment for six hours at 75° C. Tests of heated seeds after five months' storage show no loss of vitality.

ANNA M. LUTE
BOTANICAL SECTION,
COLORADO EXPERIMENT STATION

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

ANNUAL REPORT OF THE SECRETARY-TREASURER OF THE PACIFIC DIVISION

(September 30, 1926)

Membership

The following tabulation shows the enrollment for the years indicated:

1921	990	1924	1,342
1922	972	1925	1,498
1923	1,135	1926	1,471

Financial Statement for Fiscal Year ending September 30, 1926

Cash balance, forwarded from Oct. 1, 1925		$1,715.51
Receipts during the year:		
From permanent secretary's office	$1,385.00	
From affiliated societies	145.00	
From dues and fees	425.00	1,955.00
		$3,670.51
Expenditures during the year:		
Dues remitted to permanent secretary's office		$ 240.00
Supplies		34.80
Postage and supplies		52.50
Telephone and telegrams		13.07
Salary		900.00
General expense		5.00
Travel expense		20.37
Office assistance		370.00
Membership campaign		32.00
Savings account		1,500.00
Cash balance, Oct. 1, 1926		512.77
		$3,670.51

Balance Sheet, September 30, 1926

Assets:	
Equipment	$ 253.37
Savings account (Crocker First National Bank)	1,531.72
Cash on hand	512.77
	$2,297.86
Liabilities:	
Permanent secretary's office	$1,902.77
Interest, savings account	31.72
Investment	253.37
Sundry creditors	110.00
	$2,297.86

Analysis of Disbursements

Supplies	$ 34.80
Postage and supplies	52.50
Telephone and telegrams	13.07
General expense	5.00
Travel expense	20.37
Office assistance	370.00
Salary	900.00
Membership campaign	32.00
	$1,427.74
These disbursements were from funds derived as follows:	
Affiliated societies	$ 145.00
Entrance fees	185.00
From permanent secretary's office	1,097.74
	$1,427.74

(Signed) W. W. SARGEANT,
Secretary-Treasurer