superior, 26; right superior, 29. In criminals, however, the left side is 11 per cent more sensitive than the right; and their sensibility is only 83 per cent of the normal; *i. e.* their sensibility is more obtuse, and the normal relations on the two sides are reversed. In 100 criminals the sensibility is equal bi-laterally in 54; left superior in 27; right superior, 18. One hundred and four insane patients were examined, 43 per cent of whom were more sensitive on the right, 33 per cent on the left side, and 24 per cent were equally sensitive on the two sides. As left-sidedness of this kind becomes more frequent, the difference between the two sides of the body becomes greater. This phenomenon the author calls 'laterality,' and recognizes as a true pathological symptom. In the blind, as in normal people, the right side is the more sensitive, and is as much as 13.5 per cent superior to the left. But their absolute sensibility is 96 per cent of the normal,[1] *i.e.*, slightly less than that of seeing persons. The male blind are more sensitive on the left side, the females on the right. Their 'laterality' and prevalence of left-sidedness allies them to abnormal classes. In deaf mutes the left sensibility is 15.5 per cent better than the right, and their absolute sensibility is like that of the blind, 4 per cent inferior to the normal. Left-sidedness, too, is prevalent.

J. J.

COMPOSITION OF THE WHEAT GRAIN.

THE various grades of wheat flour differ from each other, chiefly as regards the admixture of the outer coats of the grain and of the germ found in the pulverized endosperm which constitutes the bulk of the flour. The problem which M. Girard in his recent book[2] proposed to himself was to separate the grain, not into flour and bran, but into the several tissues of which the microscope shows it to be composed, to determine the proportion of each contained in the grain, to analyze each, and, finally, to determine from these and other data the alimentary value of each tissue and the advisability of allowing it to enter into the finished flour. By very ingenious methods, and the expenditure of much time and patience, he was able to separate, first, the coats of the grain from the endosperm, and, second, the several tissues of the seed coats from each other. The results of this laborious investigation are very interesting, and enable us to form a much more accurate notion of the quantitative distribution of nitrogenous matters, ash, woody fibre and fat among these tissues than was possible before. At the same time it cannot be said that, aside from this, they constitute any very material addition to our knowledge. They show that the 'aleurone layer' is rich in nitrogenous matters, and contains very nearly all of the nutritive substances found in the seed coats, but this was well enough known before.

Of more general interest are his investigations of the nutritive value of the several seed coats, and of their influence upon the quality of bread; but here, unfortunately, a prejudice becomes apparent which detracts seriously from the value of the investigations. The author entitles this section of his book 'Experiments upon the *non-digestibility* by man of the envelope of the wheat grain' (the italics are ours), and he allows this prepossession to lead him into some serious errors in interpreting his results. His digestion experiment (but one was made) was executed upon himself, and, according to his interpretation, showed that but an insignificant proportion of the total dry matter or of the proteine of the envelope was digested. Before the experiment, however, he extracted his materials with water. The amount of matter thus extracted is stated, but it is not counted as digestible, as it evidently should be, because, as the author himself says, "it is evident that they (the extracted matters) would be dissolved in the digestive apparatus."

Correcting this error, and also a gross error in the method of calculation employed for the proteine, we find that there was really digested 22.8 per cent of the dry matter and 35 per cent of the proteine of the envelope, or that it contained 22.8 per cent of total digestible matter, including 6.5 per cent of digestible proteine. Girard's figures are 6.77 per cent of total digestible matter and 0.73 per cent of digestible proteine!

Rubner, in some recent investigations[1] obtained still higher figures, viz., 31.3 per cent of the dry matter, 61.1 per cent of the proteine, and 26.6 per cent of the non-nitrogenous matters; but his figures were obtained by a rather complicated calculation, and refer rather to commercial bran than to the clean seed coats of Girard's experiments. There is no sort of doubt that a not inconsiderable proportion of the seed coats is digestible by man, but, as Girard emphasizes, when calculated upon the whole grain the proportion thus utilized is small, while the quality of the bread is impaired. This is particularly the case with raised bread. According to Mège-Mouriès

[1] This conclusion is contrary to the prevailing opinion. Moreover, the careful experiments of Czermak on blind boys showed very clearly that their sensibility was better than that of seeing persons. It should also be noted that the left side is frequently referred to as the more sensitive.

[2] *Composition chimique et valeur alimentaire des diverses parties du grain de froment.* Par M. AIMÉ GIRARD. Paris, *Gauthier-Villars*, 1884. 67 p., 3 pl. 8°.

[1] Jahresbericht über thier-chemie, xiii. 384.

(quoted by Girard), the envelope contains a soluble ferment resembling diastase, which, during the raising process, at the same time converts starch into sugar and diminishes the elasticity of the gluten, thereby tending to make the bread heavy, while it also imparts a brown color to the bread. Bread made with baking-powder would naturally escape these effects to a large extent.

It is certain that wholesome, palatable bread can be made from whole wheat flour, and, for dietetic reasons, many may prefer it. From an economic point of view, however, it can hardly claim any great advantages, so long as nearly every one can command a mixed diet, and the bran can be profitably utilized as cattle food.

THE ENGLISH SPARROW.

THE question of the policy to be pursued toward this bird is fast becoming one of importance; and in many parts of the country stringent measures of extermination are urged by the indignant citizens. A committee of the American ornithologists' union recommended as the result of their inquiries,—

1°. That sheltering or otherwise fostering the sparrow by the public be discouraged, and that its introduction artificially into new localities, and its sale for such purposes, be forbidden by law.

2°. That all existing laws protecting the sparrow be repealed, and that bounties be offered for its destruction.

The states at present protecting this species are Maine, New Hampshire, Vermont, Rhode Island, New York, New Jersey, and Ohio. There are also protective laws in the District of Columbia and Canada. The Massachusetts law has been repealed and specially exempts the English sparrow from protection. The protective law has also been repealed in Michigan.

The earliest known date of importation of the bird is 1858, when Mr. Thomas A. Deblois liberated a few in Portland, Me. These disappeared shortly afterward, and were not successfully replaced until 1875. In 1858 sparrows were liberated at Peacedale, R.I., by Mr. Joseph P. Hazard. They were first introduced into Central park, New York city, in the year 1860. In 1864 twelve birds were turned loose in Madison square, New York city. In 1868 the species was first introduced into Boston common; in 1869, in the parks of Philadelphia; and a little later it became resident at Indianapolis, Ind. In a period of about ten years the sparrows spread through New England and the middle states, and many of the western states, without artificial assistance. In the southern and the western states, beyond the Mississippi River, the bird has not been observed. In Canada it has become generally distributed over the southern sections of Quebec and Ontario, and in 1884 several flocks invaded New Brunswick.

The bird is evidently spreading itself with extreme rapidity, which should be expected from a bird that hatches from three to four broods of four each in a single season.

In regard to the food of the sparrow, little seems to be settled except that it prefers vegetable food to animal, but will eat insects if driven to it. It is capable of doing great injury to grain, and is a great pest to fruit-raisers. I have seen flocks of them in cherry-trees doing far more mischief than the robin, and I have seen them in early spring nip off the young buds of peach-trees without any apparent reason, other than a desire not to be idle. Seeing that they did not appear to eat the buds, I killed two to see their reason for this destruction. I found nothing in their stomachs except crumbs that had been fed them that morning.

The bird has little to recommend it, is noisy, dirty, and disagreeable both to man and to other birds; and there is every reason why we should do in this country as it has been found necessary to do in others,— enact laws looking to their extermination.

RALPH S. TARR.

THE EFFECT OF THE SETTLEMENT OF NORTH AMERICA UPON ITS WILD ANIMALS.[1]

THE common deer was abundant from Florida to Canada, throughout the eastern half of the United States, when Europeans first settled in this part of North America. It is now restricted to the sparsely-settled forested portions of this area, and is rapidly decreasing in numbers. The 'elk,' or wapite, ranged throughout temperate North America as far east as the Blue Ridge. For many years it has been wholly extirpated east of the Great Plains and in the Rocky Mountains, and in the far west generally is rapidly approaching extinction. The moose and the caribou have been driven northward in New England and southern Canada to still unsettled forest regions; while the bison, formerly ranging in considerable herds eastward to the Alleghanies, and occupying the Great Plains in countless numbers, is now practically extirpated; a few small bands, remotely scattered, and numbering a few dozen individuals each, constituting the insignificant remnant of the millions that, less than twenty years ago, covered the Plains, from Texas to the Saskatchewan. The pronghorn and

[1] Condensed from an article by Ernest Ingersoll, in Bull. Amer. geogr. soc., 1885, No. 1.