eral departments of horticulture in the state and agricultural colleges of the United States are offering work leading to the degree of doctor of philosophy.

This change is to be commended, provided the students who desire this graduate training are properly prepared for it. Unless they are required to lay a good foundation through work in fundamental subjects during their undergraduate days, the problem of transforming them into real masters of science and doctors of philosophy in horticulture is very gigantic, if not impossible. As yet it can not be asserted that they measure up to expectations. Data have been taken on twenty-five graduate students in the agricultural division at the Michigan State College. Sixteen of them were in horticulture, the remainder in various other departments. Three were graduates from Canada, while twenty-two of them possess diplomas from the various agricultural colleges in ten different states of the Union. The record is given in the accompanying table.

UNDERGRADUATE WORK OF 25 GRADUATE STUDENTS

| | No. of semester hours credit | | | |
|---|---|---|---|---|
| Subject | None | 5 or less | 6 to 12 | 12 or more |
| Logic | 24 | 1 | | |
| Philosophy | 25 | | | |
| German | 19 | 3 | 2 | 1 |
| French | 18 | | 7 | |
| College Mathematics | 7 | 5 | 10 | 3 |
| College Physics | 9 | 5 | 9 | 2 |
| College Chemistry | | | 10 | 15 |

The data are very interesting. These students were adequately prepared in chemistry alone. Thirty-six per cent. had had no college physics and twenty per cent., five hours or less in that subject. Twenty-eight per cent. had not taken any college mathematics, while twenty per cen.t had taken five hours or less. Seventy-two per cent. of them knew no French, while those without German were seventy-six per cent. of the entire number. As to logic and philosophy, their preparation was nil. Furthermore, it was learned by personal inquiry that these same students were almost wholly deficient in the sphere of general cultural reading and had spent their entire time while undergraduates in taking purely practical subjects in their several fields.

Clearly, they were greatly handicapped in their ambition to do graduate work. It may even be conjectured that they were not fitted in the best way for life and success in the world of everyday activity. It is possible, with the exception of logic and philosophy, which are seldom, if ever, offered in agricultural and state colleges, for graduate students to take these subjects after registration in the graduate school, but is this the best plan to follow? It seems not. Instead, they should be free to devote all their time to their investigations and to the task of reading deeply and thoroughly into the extensive literature which may bear upon science in general and their own research problems in particular.

What is the remedy? Two or three suggestions may be ventured. Perhaps the academic requirements respecting fundamental subjects for graduation from our agricultural colleges might be increased to some extent without too great a diminution of the strictly practical necessities. Horticultural faculties might place more emphasis on fundamental subjects, especially in advising any undergraduate students showing ability and inclination for advanced study. A third thing which might be more potent than any other measure would be the creation of an atmosphere more conducive to scholarly effort and a profound attitude regarding the proposition of realizing a college education. With such an atmosphere in existence in an institution of higher learning it would probably be possible to require students to take at least two years' work in the more general and fundamental subjects before being permitted to enter classes in the branches of applied knowledge where they wish to major. This would be better than having them enter these classes before they have acquired any knowledge to be applied, as is now the case in most instances.

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## IS THE AUTOMOBILE EXTERMINATING THE WOODPECKER? COMMENT.

IN the issue of SCIENCE for January 15, 1926, Professor Homer R. Dill, of the University of Iowa, makes the query, "Is the automobile exterminating the woodpecker?" and presents some very interesting data, which would indicate that one species (the red-headed woodpecker) has habits which put it at a distinct disadvantage to its motorized environment in Iowa. Of this species Chapman[1] states: "Indeed few birds seem better able to adapt themselves to their surroundings. They change their fare and habits with the season, and to the accomplishments of woodpeckers add those of flycatchers and fruit-eaters." However, this wonderful power of adaptation which enables them to dine from tourists' lunch boxes has not, alas, given them sufficient agility to escape from the automobile!

But, granting this to be the case with the red-headed, are woodpeckers in general in such danger?

In northern New York and New England, at least,

[1] Chapman, Frank M., "Handbook of Birds of Eastern North America," Revised, 1919, p. 328.

where the writer is familiar with conditions, no dead woodpeckers have ever been noted along highways during several seasons of motoring; no doubt some collide with wires, etc., but the writer is not aware of any case where the automobile was at fault. Observations here would indicate that permanent residents of the woodpecker family shun highways, and that abundant food exists for them in the deep forest. The northern flicker and yellow-bellied sapsucker frequent orchards and the outskirts of town, but have not been observed in danger from traffic. The red-headed woodpecker is practically non-existent in this region, having been seen in northern New York only once by the writer, and that many years ago. Were it present in such numbers as in Iowa, it might run into the same danger.

Far from being in peril of extermination, woodpeckers in northern New England should be on the increase. The reasons for this belief are based on the following observations: (1) The great abundance of insect food available because of the devastation caused by the spruce budworm (*Cacoecia umiferana,* Clem.) in northern New England and eastern Canada during the last fifteen years and the accompanying bark beetle infestations; (2) there is every reason to believe that the natural enemies of woodpeckers are being preyed upon to an equal, if not greater, degree than woodpeckers themselves; (3) the great numbers of woodpeckers which are encountered in the forest.

During the winter and spring of 1925, spent in the forest in northwestern Maine, opportunity was presented to study the daily life of several species at close hand. The following species, present almost daily about the camp porch, are listed in the order of their relative abundance.[2]

Hairy woodpecker (*Dryobates villosus villosus,* Linn.).
Downy woodpecker (*Dryobates pubescens medianus,* Swains).
Pileated woodpecker (*Phloeotomus pileatus pileatus,* Linn.).
Arctic three-toed woodpecker (*Picoides arcticus,* Swains).
Three-toed woodpecker (*Picoides americanus americanus,* Brehm).
and, with the coming of spring,
Northern flicker (*Colaptes auratus luteus,* Bangs).
Yellow-bellied sapsucker (*Sphyrapicus varius varius,* Linn).

Hairy woodpeckers were especially numerous. On a peninsula extending into Cupsuptic Lake a conservative estimate would place the number at two to three birds per acre, eagerly at work upon insect-infested spruce and balsam fir, as well as upon paper birch attacked by the bronze birch borer (*Agrilus anxius,* Gory.). One was practically never out of earshot of the pileated woodpecker, chiselling for carpenter ants at the base of some balsam—although seen less frequently on account of his shyness. Individuals of all species were unusually plump and well-nourished. No stomach examinations were made, but fragments of bark which littered the ground suggested that Pityktеines, Ips, Dendroctonus, Monochamus and many other genera were included in their food.

Following the nesting season many of the young made their appearance at the feeding station; they were exceptionally fat creatures, not differing appreciably in size from their parents. While no counts were made of the number of young per brood, there is every reason to believe that the abundance of food led not only to an unusually large "crop" of young, but also reduced the mortality during the nesting stage.

In conclusion, it is the writer's impression that the automobile can not be said to be exterminating woodpeckers in the northeast. Woodpeckers are forest birds, and while some few of the 375-odd species of Picidae may become adapted to life in telegraph poles in settled regions, and enjoy the benefits and hazards of civilization, the greater number will retreat to the deep woods with the advent of man and cultivation. A much more potent enemy of the woodpecker than the automobile is the disappearance of high forests, and especially coniferous forests. And, finally, the encouragement of woodpeckers should be every one's concern, for they are some of our very best forest protectors.

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[2] The nomenclature is based on Chapman, *loc. cit.*

## HUMAN TAILS—A STATEMENT AND A CORRECTION

THERE is a very extensive literature on human beings with tails, and there are a considerable number of absolutely authentic cases.

In the Johns Hopkins *Bulletin* Vol. XII, 1901, p. 96, Dr. Ross G. Harrison has published a case and has appended quite a full bibliography. In some cases the tail has been amputated and microscopical examinations have been made showing enough muscular tissue to enable them to be moved. In other cases the existence of rudimentary vertebrae with fully formed joints between them lined with a synovial membrane has been shown.

In *Nature,* 1921, Vol. 106, p. 845, Sir Arthur Keith, the eminent curator of the museum of the Royal College of Surgeons of England, has discussed the embryological evidence for such tails. He writes me that