elected to an Isaac Newton Studentship at the University of Cambridge, and F. L. Arnott, research student of Trinity College, has been elected to an additional Isaac Newton Studentship.

IN Poland Mme. Cezaria Ehrenkreutz has been appointed professor of ethnography and ethnology at the University of Vilno, and Mme. Helen Wilman professor of Sanskrit at the University of Cracow.

DISCUSSION

A GEOLOGICAL SURVEY OF CALIFORNIA

FOR fifty-five years California was without a state geological survey, but now under the State Division of Mines a new survey known as the Geologic Branch has been established by the legislature and given a modest appropriation to maintain its activities. Though the appropriation is small to begin with ($20,000 for the biennium), there is every reason to believe that this amount will be materially increased in the future and that California will go to the front as one of the states which recognize the importance of this fundamental science.

The chief function of the Geologic Branch of the State Division of Mines is to be the coordination of the geologic work of various institutions and concerns that have done or are doing geology in California. It is to encourage and promote further scientific work and to act as a clearing-house for unpublished geological data of the state. Furthermore, so far as finances will permit, the Division of Mines will publish detailed reports on the geology of California.

It is encouraging to find that geologists and institutions interested in the geology of California are giving full support and offering much assistance and cooperation to the new undertaking. It is only with this cooperative assistance that the geologic work may be a success.

At present several interesting projects are under way. With small payment for field expenses only, it is found that excellent young men may be encouraged to continue to completion important problems upon which they are at work in connection with the winning of advanced degrees from recognized universities. The work, since it is done under the direction of the university departments, is thus controlled through geologists of highest standing and the younger research workers are thus permitted the opportunity of satisfactorily completing their chosen work and guaranteed a medium for publication.

An extensive bibliography of the geology of California, to contain also a practical working index, will be one of the first publications of this new state survey. This fundamental guide to research is now being prepared by Dr. Solon Shedd, custodian of the Branner Memorial Library at Stanford University.

A geological map of California, on a scale of 1:500,000 (about eight miles to the inch) is another goal to be reached by the new survey. A tremendous amount of unpublished detail in geology is already available for this map. It comes from many sources—scientific departments of commercial concerns as well as institutions of learning. Here again, coordination is the object, but cooperation is necessary to complete the work.

The great size of California can be appreciated only by persons traveling and working in this state. The complexity of the geology of California can never be adequately visualized by outsiders. This great size, together with the complexity of the stratigraphic and structural problems, makes the work, however, so much the more interesting, and it is little wonder that so many discussions arise regarding the intricate problems in this area.

In order to advance the knowledge of the geology of California, it will be necessary to organize our efforts, to bring to a head problems already commenced but temporarily laid aside and to avoid as much as possible the duplication of work. Thus the Geologic Branch, working under the well-established Division of Mines (formerly known as the California State Mining Bureau) with the state mineralogist, Mr. Walter W. Bradley, as executive head, will serve as a clearing-house for information regarding *work in progress*.

It would thus be advantageous for this new geological survey to know what work is being done now and by whom. Furthermore, if persons desiring to take up new problems in the state would first consult this scientific organization before attempting to spend much time and money in any particular way, it is quite possible that the information available would be of assistance in judging to what extent the area under consideration might already have been studied by others. This state division, therefore, requests further and continuous cooperation in the endeavor to keep informed concerning the geologic activities in California.

OLAF P. JENKINS
CALIFORNIA STATE DIVISION OF MINES

NOTE ON THE HIGHER ALCOHOLS OF FERMENTATION

IN the industrial fermentation of molasses for the production of alcohol there is always found a certain quantity of high boiling material which is known as fusel oil and which forms one of the chief by-products of the industry. The commercial product is obtained

from the crude material by distilling in the presence of alkali. The fraction collected below 131° contains the commercial fusel oil. After this has been removed there still remains a small residue of higher boiling material. An attempt has been made to discover the constituents of this high boiling fraction in the hope of throwing some light on the biological activities of the yeast cell. The mixture is exceeding complex and great difficulty was experienced in obtaining the compound in a state pure enough for definite identification. Some progress was made in this direction, but the work was interrupted by unforeseen complications. We were able to draw the following conclusions from the investigation, and these are hereby set down as a record which may serve in the guidance of others who may be working in this extremely interesting but difficult field.

1. Crude fusel oil from the industrial fermentation of molasses contains in addition to n-propyl, iso-butyl, secondary butyl carbinol and iso-butyl carbinol, alcohols of the hexylic, heptylic, octylic, nonylic and decylic series.

2. It seems very probable that the alcohols of these higher series which are present are the normal and the two members of each series which have the same isomeric structure as the amyl alcohols, iso-butyl carbinol and secondary butyl carbinol.

3. Normal heptyl alcohol has been definitely shown to be present. This is the first time this alcohol has been isolated from fusel oil and definitely identified.

4. In addition to the above alcohols, three other decyl alcohols are present, one of which is possibly a terpineol.

5. In the fractions boiling higher than n-decyl alcohol there are small amounts of alcoholic material of still higher molecular weight.

6. These higher alcohols are very likely produced by the vital activity of the yeast cells.

7. For this investigation to lend support to Ehrlich's theory that the higher alcohols are derived from the amino acids present in the materials fermented, it would be necessary to isolate from molasses, amino acids which could give rise to the alcohols indicated. This is impossible in the present state of protein chemistry.

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PEOPLE ATTACKED BY OWLS

IN SCIENCE for November 1, Dr. Albert M. Reese, after telling of an owl attacking people in Morgantown, West Virginia, asks if such attacks have been noted by others. A few such occurrences are on record in the lumber camps of Eastern Canada, and I know of a shanty-man who bore a large scar on his forehead from a wound caused by an owl's claw. In no instance was the species of the attacker determined, but as the bird was usually described as large, it was probably the great horned owl. The victims were mostly teamsters whose work in winter takes them out before daylight in the morning and keeps them out at night after dark. It seems likely that the owl, looking down from above, mistakes the man's fur cap for some small mammal, and pounces on it. One story runs that in a certain camp the attacks were so frequent that at last no one would venture out in the dark without half a pork barrel over his head!

CHARLES MACNAMARA
ARNPRIOR, ONTARIO, CANADA

IN regard to Professor A. M. Reese's remarks concerning people being attacked by owls, I may mention that this happened to me several times during four or five years. There is a large gin house surrounded by young live-oaks near my dwelling. This gin house harbors many rats and mice, and no doubt is a good hunting-ground for the owls, which in the mating season often perch on the live-oaks with their young. These owls seem to be the small kind that usually frequents barns. I have often been bothered by them when walking around the trees, and once when my wife was with me she was attacked also and had an ear scratched. The owls fly around the head and hair, seemingly trying to scratch, and make a noise by snapping their bills. These attacks occur only when the birds have young and never before dusk. I do not believe they are caused by any inherent viciousness in the owls, but rather by a strong desire to drive one away from their young.

A. SION
KYLE, TEXAS

OWLS have frequently been known to mistake the human head for the small hair-covered animals upon which they prey. The "man with scant supply of hair" mentioned by the correspondent from West Virginia does not therefore come in for especial distinction though if a really bald man should be struck I should be moved to tell my story of a great snowy owl which struck the shadow on a tent wall one moonlit summer night in Montana.

It is a practice in the northwest, when sleeping in the open, to cover the hair with hat or stocking cap. The talons of an owl can put out an eye and almost scalp a man, as has happened in lumber camps. Usually the victim does not hear the soft-feathered wings and runs back to camp with a story of murderous assault. Unfortunately, we have not heard