

distort the speech before it is heard, by introducing filters, overloading the amplifier, adding various kinds of noise, etc.

This set-up was first demonstrated before a meeting of the Ohio Association of College Teachers of Speech this spring. In this demonstration, all frequencies above 1,500 cycles per second were removed from the speech as heard through the loudspeaker. A disturbing amount of noise was added by a loud buzzer. Under these conditions, sentences were practically never intelligible to any one. Only a word or two could be occasionally recognized. When the inside booth lights were turned on, however, sentences were correctly understood by practically every one, although the speech sounds were just as greatly distorted as before. This experiment is very effective in demonstrating the important part played by vision in speech understanding, even when untrained.

One of the major functions of our laboratories is the detection of students with deficient hearing from among those entering the university and the provision of special training for such students. A motion picture method of developing visual hearing was introduced in our laboratories and has been in successful use for the last five years. In this way students learn to understand speech with the auditory element entirely removed. Under this training students soon acquire strengthened visual speech associations which serve materially to facilitate their university work.

We are planning a series of articulation and intelligibility tests for use with this booth. These tests have been standardized by workers in the Bell Telephone Laboratories and have been used extensively in investigating telephone systems. The addition of the visual factor should be of interest to telephone engineers, talking picture producers and others, as well as to workers with the deaf and hard of hearing.

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A PHENOMENON IN FUNGI IMPERFECTI

WHILE doing research on variation phenomena in *Fungi imperfecti* it was observed that many isolates, representing 28 strains, 12 species and 7 genera in 3 orders of this group, behaved similarly to bacteria, in that single-spore culture series (composed of from 20 to 100) showed them to be dual in nature. Such single-spore series gave rise to three growth types, one mainly mycelial in character with scant or no production of conidia (designated as M), another usually with limited mycelial growth but producing conidia abundantly (designated as C) and a third type (X) similar to the primary isolate but intermediate in cultural characters between M and C. In *mass transfers* from M and C, cultural characters remained con-

stant. In mass transfers from X, cultural characters were not uniform and constant but varied between those of M and C. Subsequent single-spore analyses of the three types revealed the fact that M and C were apparently definite entities as they retained their respective characters, whereas X again gave rise to the three types M, C and X. The X type can be produced *in vitro* by growing M and C together in mixed culture where they apparently combined by the mechanism of anastomosis. Single-spore series from such a combined culture, even when the spores are taken from a given sporocarp or from a single spore head, give rise to the three culture types, M, C and X. This behavior indicates that the X type is really heterocaryotic¹ and that the M and C phenomenon as it occurs in the laboratory is due to dissociation of discrete nuclei and not to mutation or nuclear change. Some of the M and C types have been kept in culture for more than five years and are still true to type. In this respect they seem to differ from smooth and rough in bacteria, which, according to the majority of investigators² (working mainly with mass transfers), may change rather rapidly from one form to the other, either directly or through intermediate forms. A more detailed account of the M and C phenomenon will be published soon.

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THE DESTRUCTION OF "VERMIN"

THE writer, who is not interested in killing for sport, is in constant disagreement with his sportsmen friends in regard to the wholesale destruction of certain animals classed by organized sportsmen as "vermin."

As has often been pointed out, many of these animals, even if not of positive economic value to the community as a whole, are of great interest to nature lovers, and these non-killing nature lovers have as much right to enjoy animals alive as the sportsmen have to enjoy them dead. There are many sportsmen who are "sports" enough to concede this point.

Although most organizations of sportsmen do not realize it, there is considerable difference of opinion as to the actual part taken by predatory animals in the reduction of the total amount of game. There are other factors of perhaps greater importance than the predators.

As chairman of the West Virginia Biological Survey, the writer has been collecting the reports of the vermin-destruction contests held in 1935 in 40 of the 55 counties of the state. In these contests, local mer-

¹ H. N. Hansen and Ralph E. Smith, *Phytopathology*, 22: 953-964. 1932.

² Philip Hadley, *Jour. Inf. Dis.*, 40: 1-312. 1927.

chants and other persons offer substantial prizes to those killing the greatest numbers of the animals on the "vermin" list.

In the Biennial Report of the Conservation Commission of West Virginia for 1933-35, a list of "vermin" killed in the fiscal year 1933-34 was published (see

TABLE I

1933-34	Pieces of Vermin
Hawks	3,007
Hunting house cats	1,892
Snakes	79,481
Water dogs	13,497
Crows	9,438
Weasels	1,430
Grey fox	1,451
Turtles	15,370
Kingfishers	1,030
Rats and mice	34,475
Garfish	87
Terrapins	4,417
Mink	321
German carp	59
Red squirrels	399
Chipmunks	18,089
Owls	954
Starlings	3,985
Wild cats	311
Timber wolf	1
English sparrow	1,907
Total	191,511

Table I). Only 26 counties held contests during this year.

The report continues:

During the fiscal year 1934-35 forty counties have sponsored and conducted vermin control contests. This is an increase of fourteen contests over the previous year.

While the actual results are not available at this time, information in our possession, based on partial reports, indicate the results will greatly exceed the previous year's showing. A conservative estimate will show a grand total of three hundred thousand predatory animals, birds and snakes disposed of by these beneficial contests.

If 300,000 animals are destroyed in a single season in a small state like West Virginia, what would be the total for the entire country if these "beneficial" campaigns were held everywhere?

Of course there are several animals of this list that might well be exterminated, but there are more which are not only of general interest but are of actual benefit to man.

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REPORTS

RESEARCH PROGRAM OF THE ILLINOIS STATE GEOLOGICAL SURVEY

THE biennial appropriation for the Illinois State Geological Survey for 1935-36, as recently made by the State Legislature and approved by Governor Henry Horner, is \$312,750. This total is the same as the appropriation for the last biennium, except that the governor permitted the item for contingency, which amounted to \$30,000, to be redistributed among the standard items of the appropriation in order to permit better planning in the use of the funds.

The scope of the survey's current research program extends from the raw materials as they occur in the ground to industrial research on utilization and marketing. Projects already under way cover most of the state's minerals, including coal, oil and gas, clays and clay products, woolrocks, silica, fluor spar, sand and gravel, and other useful or potentially useful mineral substances.

Coal: Studies in coal include: completing the outlining of areas of strippable coal; laboratory studies in gas, coke and by-product making properties of coal; conversion of slack coal into smokeless briquets; study of electrical resistivity method as applied to exploration for shallow coal beds; and study of the physical, chemical and botanical constitution of Illinois coals and of the separability of their banded ingredients with reference to the possibility of finding improved and new uses.

Oil and Gas: Studies in oil and gas will center about geological exploration for new areas structurally and stratigraphically favorable to oil and gas accumulation, and improved methods of oil recovery, particularly water-flooding. Reports are in progress on the western Lawrence County oil field and on the protection of oil-well casing from corrosion. Special studies of drill cores of oil sands with reference to porosity, permeability, saturation and estimation of reserves will be made.

Clay and Clay Products: An investigation is being made of Illinois face brick and the possibility of using Illinois peat mixed with clay in the manufacture of light-weight structural and refractory products. Exhaustive research is being made, by means of petrography, the x-ray and chemistry, into the mineralogical constitution of Illinois clays, with a view to discovering the control that is exercised by the mineral constituents and their texture upon the products, how these products may be improved and new ones made.

Silica: Laboratory studies are investigating the use of ganister and novaculite from southern Illinois as raw materials for silica refractories.

Rock Wool Resources: The discovery of deposits of rock and the determination of the range of chemical compositions suitable for the manufacture of rock wool, as announced in a detailed bulletin last fall, has resulted in the creation of a new and promising in-