words have two acceptable spellings. When one of these spellings has a specific meaning, it should be favored for that one particular connotation.

The etymology of the word is in doubt. The Oxford Dictionary (1893) states:

> Char . . . Forms: 7-chare; 7–8 charr; 8 char. (Known in books only since 17th century; but may have been in local use long before. Etymology unknown; possibly a Celtic origin; Gael. *ceara* red, blood-coloured, *cear* blood; also the Welsh name *torgoch* red-bellied.) A small fish (*Salmo salvelinus*) of the trout kind. . . .

Webster's New International Dictionary (1934) says:

> *Char*, n; pl. *char* (collective) or *chars*. Also *charr*. (Gaelic *ceara* lit., red, blood-colored; French *cear*, blood; From its red belly.) Any trout of the genus *Salvelinus*.

Other meanings given for *char* as a noun include: (i) short for charwoman (scrubwoman); a chore; (ii) a chariot; cart; (iii) a charred substance; charcoal (as a verb, the word is a synonym for scorch); (iv) a sandbank; a bar of sand or mud. Additional meanings, most of them now obsolete, will be found in the Oxford Dictionary under *char*.

Although the Oxford Dictionary and Webster's New International Dictionary place *char* in the preferred spelling position, *charr* is used only when referring to the fish, whereas *char* is given many other meanings. At least two other monosyllabic words ending in double consonants are in common usage among ichthyologists. *Parr* (a few early English papers used *par*), a young salmon before it has gone to the sea, and *redd*, the nest or depression in gravel into which salmon eggs are deposited. However, *charr*, a fish of the genus *Salvelinus*, is given secondary position to *char* in the afore-mentioned references, and it may not appear at all in some newer references.

Although both forms of spelling can be based on early popular use, the term *char* does not appear in professional literature until 1865 (nearly 2 centuries after Willoughby, in one of the earliest scientific papers on fishes, in 1686 had used the double *rr* in his *Historia Piscium*) when Jonathan Couch introduced char to the scientific literature of England [*History of the Fishes of the British Islands* (1865), vol. IV, p. 253]. George Suckley introduced the term to American scientific literature in 1874 [*U.S. Comm. Fish* and *Fisheries*, pt. II, *Rept. of Commissioner for 1872 and 1873*, appendix B, pp. 91–161]. The only author I know of who changed from one form to the other (without the influence of coauthors) was Sir Francis Day, who used *charr* in his works from 1880 to 1884 and *char* in 1887.

A survey of professional ichthyological papers that I published prior to 1951 reveals that of 76 authors who have used the term, 42 preferred *charr* (21 of these were American authors), and 34 preferred *char* (only eight of whom were American authors). Practically all articles published in English by Swedish, Norwegian, Danish, English, Canadian, Australian, and New Zealand writers since 1900 tend to spell the term *char*, owing, no doubt, to its preferred position in recent editions of such references as the Oxford Dictionary, Webster's Dictionary, and the Encyclopedia Britannica. This preferred position in these references stems from the contributions of C. Tate Regan and Day. Since 1900 practically all American ichthyologists have followed the precedent set by Jordan who used *charr* in his papers.

With a middle name such as his own, David *Starr* Jordan was well aware of a fundamental reason for spelling the term *charr*. It has long been, and still is, customary in English usage that, whenever a common monosyllabic word such as *cap* or *cat* is used as a collective or proper noun naming a particular person, place, or thing, or group of them, the consonant is doubled as in *Capp* or *Catt*. For example, of the 23 names listed in the Portland, Oregon, telephone directory for June 1950 ending in *r* or *rr*, 20 representing 327 individuals, spelled their names with a double *r*, whereas only three, representing five individuals, were found using the single *r*.

WILLIAM MARKHAM MORTON
U.S. Fish and Wildlife Service,
Portland, Oregon

4 April 1955.

Entomogenous Fungi in Puerto Rico

The Weather Bureau in San Juan, Puerto Rico, for the week ending 16 October 1954 reported:

> The sudden recurve of the hurricane "Hazel" toward the northeast produced heavy to excessive amounts of precipitation over the eastern half of the Island, while moderate to heavy amounts were reported from the western districts. The greatest individual amount during the week, 19.00 in., fell at Gurabo, where the greatest 24-hr amount, 12.00 in., was recorded on 13 October.

By comparison, the rainfall in the metropolitan area was moderate, the Experiment Station at Río Piedras receiving only 3.25 in., and on the northwest coast, the Isabela Substation recorded 1.96 in. Subsequent precipitation was very moderate, with temperatures approximately normal for this season of the year.

Quite aside from its effects on crops—it completely destroyed minute tobacco plants in the seedbeds of some districts—the excessive rainfall appears to have resulted in a very unusual outbreak of entomogenous fungi. Records of entomogenous fungi indicate that, although individual insects may be found dead at almost any time, extensive outbreaks responsible for total elimination locally occur only under exceptional conditions of temperature and humidity. Thus, it seems desirable to consider whether the excessive humidity accompanying the "sudden recurve of hurricane Hazel" was the really decisive or dominating factor in causing the outbreaks of entomogenous fungi that have since been observed.

The seagrape sawfly, *Sericocera krugii* (Cresson),

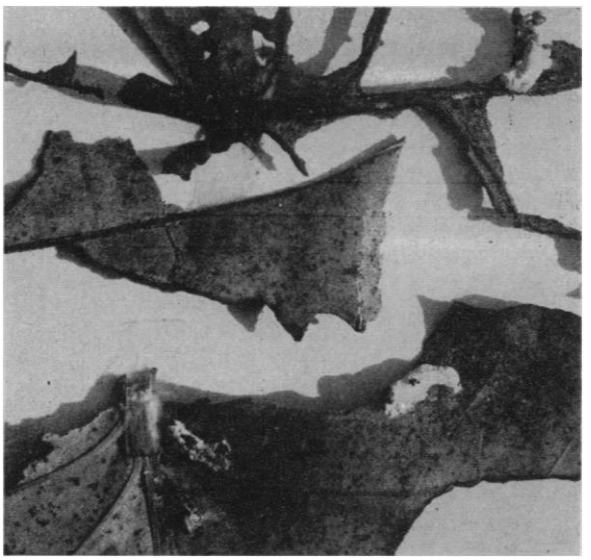

Fig. 1. Mummied sawfly larvae *in situ* on the partly devoured seagrape leaves. [Photograph by Roldán]

a common pest on seagrape, *Coccoloba uvifera* (L.) Jacq., and the only sawfly in Puerto Rico, appears to have no natural enemies; no specific parasites and no previously recorded entomogenous fungi had attacked it. On 30 November extensive occurrence of partly eaten leaves of seagrape was noted on the beach at Islote (between Arecibo and Barceloneta), with all sawfly larvae, from smallest to largest, killed by the attack of a chalky white fungus, with only the chitinized yellowish head remaining uncovered to indicate the identity of the insect (Fig. 1). Paul Lentz of the National Fungus Collections at Beltsville, Maryland, and Edward A. Steinhaus of Berkeley, California, are agreed that the entomogenous fungus responsible is *Beauveria bassiana* (Balsamo) Vuillemin.

Vera K. Charles in her "Preliminary check list of the entomogenous fungi of North America" (*1*) records *Beauveria globulifera* from Puerto Rico only as attacking the pentatomid bug *Thyanta custator* (F.) and the coreid bug *Corecoris batatas* (F.), and specifically no sawfly anywhere. Presumably this was quite a different strain of the fungus on these stinkbugs from that now found on the caterpillars of sawflies. Even D. M. MacLeod, reporting on the most recent "Investigations on the genera *Beauveria* Vuill. and *Tritirachium* Limber" (*2*) lists many Lepidoptera attacked by this fungus in Canada, but only four sawflies.

Mass destruction of heavy infestations of the guava whitefly, *Metaleurodicus minimus* (Quaintance) by *Aschersonia* spp. is so conspicuous—the bright red, orange, and yellow fruiting bodies bulking enormously on the comparatively insignificant bodies of the insects—and it is so well known that little attention was paid to the extensive collections of material brought by Felix Aróstegui from the Isabela Substation early in December.

On 9 December a heavy infestation of *Coccus viridis* (Green) on citrus leaves, collected in Pennock's Gardens, Río Piedras, was so thickly covered with *Aschersonia goldiana* Sacc. & Ell. (det. Lentz) that only with difficulty was it possible to identify the insect. On 19 December in the mountains at Cidra, mass infestations of *Myzus persicae* (Sulzer) on the underside of the leaves of flowering plants of wild mustard, *Brassica integrifolia* (West) O. E. Schultz, had been entirely eliminated by *Acrostalagmus aphidum* Oud., which was identified by Lentz. Material subsequently collected at Orocovis was identified as *Empusa aphidis* Hoff. by C. G. Thompson of the Insect Pathology Laboratory at Beltsville.

Within less than a month, four different genera of entomogenous fungi, on four groups of insects (sawflies, whiteflies, scale insects and aphids) had been noted at widely separated localities in Puerto Rico, within 6 to 8 wk after exceptionally heavy rains, but not at the localities experiencing the heaviest rainfall. Was this merely a coincidence, or were conditions after the rainfall optimum for the development of the entomogenous fungi?

GEORGE N. WOLCOTT

Agricultural Experiment Station,
Rio Piedras, Puerto Rico.

References and Notes

1. V. K. Charles, *Insect Pest Survey Bull.* 21 (suppl. to No. 9) (1941), pp. 707–785.
2. D. M. MacLeod, *Canadian Journal of Botany*, **32**, 818 (1954).

18 April 1955.

Activity in 1953–54 of Mihara Yama, O Shima, Japan

Mihara Yama, the central cone of O Shima Volcano on O Shima, an island 110 km south-southwest of Tokyo, Japan, has been active repeatedly in historical times. The major eruptions that occurred in 1950 and 1951 have been described (*1*); this supplement (*2*) describes the smaller eruptions that followed in 1953 and 1954.

At the end of the 1951 eruption, subsidence in the crater at the site of the preeruption inner pit formed a depression that enlarged until it measured about 400 m east-west, 250 m north-south, and 50 m deep. Just south of this an adjacent depression about 150 m in diameter and 50 m deep was formed when collapse enlarged the crater of the principal 1951 cone. No further conspicuous topographic changes occurred until October 1953. Steam and other gas emission were slight during this period, and the crater area was relatively cool.

Renewal of activity was first indicated when the Wiechert seismograph recorded minor earth tremors at the O Shima Meteorological Observatory, beginning about 7 P.M. on 4 October 1953. Rumbling was heard later. At 8 : 32 A.M. on 5 October 1953, an explosion opened a new vent about 1.5 m in diameter