his colleagues find that their habits are different. The destruction of the prickly pears in the course of a few months by the species called *Dactylopius tomentosus* has been amazing; the more so, because in its native country this species never works such havoc. But it is found that different cochineals infest different species of *Opuntia*. The Indian cochineal (really American, but imported into India and Ceylon) attacks *Opuntia monacantha*, but refuses all other species of these cacti. The cochineal common in our southwest, *Dactylopius confusus*, similarly restricts itself to certain species, though not to a single one. Still another sort, *D. newsteadi*, is as efficient against *Opuntia imbricata* as *D. tomentosus* is against *O. inermis* and *O. stricta*, but it will not attack the other kinds. Thus we see how necessary it is, for the purposes of economic entomology, to critically distinguish between closely allied insects. The species of cochineal may possibly prove to be quite numerous, but at present we can distinguish the following:

(1) *Dactylopius coccus* Costa (*signoreti* Ckll.). The commercial cochineal.

(2) *Dactylopius opuntiae* (Lichtenstein in litt., Ckll.) is probably the more correct name for what is called *D. tomentosus* (Lamarck). We know exactly what it is, and in view of the now known diversity of types, it is probably impossible to say which Lamarck had or referred to.

(3) *Dactylopius confusus* (Ckll.), common in the Rocky Mountains of Colorado, and New Mexico, and in other southwestern states. The material from Ceylon, South Africa and Florida ascribed to *D. confusus* may not all pertain to this species.

(4) *Dactylopius greenii* n.n. (*Coccus confusus capensis* Green, 1912, not *Coccus capensis* L., 1766). Described from South Africa, but of American origin, and thus inappropriately called *capensis*. It occurs on *Opuntia monacantha*, and has been imported into Australia.

(5) *Dactylopius ceylonicus* (Green, 1896) (*indicus* Green, 1908). Also carried to Australia, and very effective against *O. monacantha*. The names applied to it are inappropriate, since the species originated in America, and is at home in Argentina. It has been very efficient against *O. monacantha* in India and Ceylon, but the related *O. dillenii* is practically immune. The name *ceylonicus* (*Coccus cacti* var. *ceylonicus*) was first published, and the brief description given prevents it from being a nomen nudum. Also, the name *Dactylopius indicus* is preoccupied.

(6) *Dactylopius newsteadi* (Ckll.), described from Arizona, and now carried to Australia. The locality, Colorado, given in the Fernald catalogue, is an error.

(7) *Dactylopius argentinus* Dominguez, 1907. Argentina, on *Opuntia ficus-indica* and *O. aurantiaca*. Whether this is valid, I do not know. *D. opuntiae* will not attack these species.

Another very interesting observation relates to the red-spider (really a mite) of the prickly pear, *Tetranychus opuntiae* Banks. This has been considered synonymous with the common greenhouse species, on morphological grounds, but its habits indicate otherwise. It is very efficient against *Opuntia inermis*, but can not be transferred to the plants infested by the common red-spider. Its operations induce the cactus to form a corky layer, analogous to gall-formation, and it is very remarkable that this process, once started, goes on, beyond the actual location of the mites, until it covers and smothers the joint. Mr. Dodd records (1927) that "although quite different in its mode of attack, the red spider is equally as important as the cochineal; together these two insects form a harmonious combine by which there is every reason to believe that the dense scrub areas of *O. inermis* will be eradicated." The prickly pear mite was described from Arizona, but the Australian material was obtained from Texas.

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JANUARY 23, 1929

THE SMALLEST LIVING VERTEBRATE

UNQUESTIONABLY the smallest fish and the most diminutive of all vertebrates is a Philippine goby discovered by the writer and described in his volume entitled "Gobies of the Philippines and China Sea."

In 1902 Hugh M. Smith described a minute goby from Lake Buhi, Luzon, under the name of *Mistichthys luzonensis*. This species when full grown has an average length of 12.5 mm, males varying from slightly less than 10 to 13.5 mm in length; ripe females ranging from a little over 11 to 14 mm in length. This tiny fish, known as *sinarapan* in the Bikol language, occurs only in Lake Buhi, where it is exceedingly abundant and is caught in large numbers for food. It is easily the smallest commercial fish.

Tiny as *sinarapan* are, they are not nearly so small as a fish collected in the tidal creeks about Malabon, a town a few miles north of Manila. This species, which I named *Pandaka pygmaea*, is known from only seventy-five specimens. Adult males range from 7.5 to 9 mm in length, and females distended with eggs are from 10 to 11 mm long.

Compared to all other Lilliputian fish from various parts of the world both *Mistichthys luzonensis* and *Pandaka pygmaea* are very much smaller, even when not so very much shorter. They are both slender fishes and in life are colorless and so nearly transparent that only their large black eyes are visible. Conditions in the Philippines and especially in Luzon have produced an extraordinary variety of gobies,

but it is remarkable that the island of Luzon should have produced the two smallest species of fish in the world, both gobies.

ALBERT W. HERRE

THE HYDROGEN-ION CONCENTRATION OF THE BLOOD IN CANCER

BOTH the lay and the scientific press have recently given considerable publicity to the low hydrogen-ion concentration of the blood in cancer. This is chiefly due to Dr. Ellice Macdonald, who mentions the subject in an address published in SCIENCE of the 15th *instant.* He seems to credit the discovery to Reding, of Brussels, making no mention of Dr. Maude Menken. Dr. Menken first observed the low hydrogen-ion concentration of the serum in cancerous patients and published her results in the *Journal of Cancer Research,* vol. 2, 1917.

H. O. NOLAN

ISOGRAM VS. ISONTIC

UNDER the title "Isontic?"[1] Lane voiced the need for a generic term applicable to the whole class of iso- and equi-lines and surfaces. Comment on this paper by Miller led to correspondence that we hope may be of sufficient interest to the readers of SCIENCE to merit a brief summary.

"Isogram" was proposed for the same purpose by Francis Galton in *Nature* (40: 651, 1889) and it has found acceptance by others.[2]

The expression "connecting points of," used by Galton and by Lane in defining isotherm and other isograms, lacks uniqueness, since lines not themselves isotherms can connect points of equal temperature. We recommend in lieu of it, the phrase "consists of" *e.g.,* isotherm, a line (or by extension surface) consisting of (extending, traced or drawn through) points of equal temperature. An isogram would be a line (or surface) all points in which are equal in some one respect.

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QUOTATIONS

A DESCENDANT OF JOHN HUNTER

ON February 11 there died in the Sisterhood Home, St. Hilda's, Shirland Road, Paddington, where she chose to spend the evening of a life spent in well-doing, Miss Helen Hunter-Baillie, the senior representative of the Hunter family and a woman of exceptional ability. She was eighty-five years of age, and could read without glasses and retained her freshness of mind to the end. On the death of her sole surviving brother in 1895 she became "laird" of Long Calderwood—the birthplace of William and John Hunter, and also of Dorothea Hunter, who became the mother of Dr. Matthew Baillie, physician, and Joanna Baillie, poetess. The excellent state of preservation of the old farmhouse at Long Calderwood is owing to Miss Hunter-Baillie's care and vigilance, and to the keen and intelligent interest she took in all that pertains to the men who did so much to mould the progress of medicine in this country during the eighteenth century. Her father, Mr. William Hunter-Baillie, was the only surviving son of Dr. Matthew Baillie, and was born in 1797 within the school which Dr. William Hunter built in Great Windmill Street—a building which still serves as an annex for the Lyric Theater. He was educated at Westminster School and Balliol College, Oxford, was called to the Bar, and, although he never practised, did act for a time as marshal to his distinguished uncle Lord Denman. He inherited a fortune from his father, devoted himself to literature, society and good works, and imparted much of his tastes and learning to his daughter, Miss Helen Hunter-Baillie. He lived for the greater part of his life at 96, Harley Street, and died in 1894 at the age of ninety-seven, and in his home Miss Hunter-Baillie met the leaders of literature and science of the nineteenth century. She wrote in her retreat a small typewritten volume of valuable reminiscences, a copy of which is preserved in the library of the Royal College of Surgeons of England. . . . At an early date she began to collect all old letters which had come down in the family from the Hunters, Baillies, Jenners, Barons, Denmans, Crofts; and these she arranged and catalogued and bound in seven volumes, and presented this valuable collection of documents to the library of the Royal College of Surgeons. To Miss Hunter-Baillie and to her brother, Captain William Hunter-Baillie, the Royal Colleges are indebted for many valuable portraits and busts of the Hunters, Baillies and also of Jenner. At the Hunterian Oration, given biennially in the theater of the Royal College of Surgeons, she was always a welcome guest, and had assigned to her a place of honor, which she well became. Students of the lineaments of John Hunter saw in her face, head, body, deportment and inquiring mind much which reminded them of those of her grand uncle. She was keenly interested in the Hunterian collections preserved in the museum and

[1] SCIENCE, 68: 37, 1928.

[2] Talman, *Sci. Am. Supp.,* Nov. 12, 1910, and *Monthly Weather Review,* 43: 195, 1915.