That was fifteen years ago, but whenever I discover a rat hole in the establishment I administer prompt justice with chlorine and acid.'"

Spectroscopic Notes.

Prof. H. Vogel recommends the use of a small hydrogen flame for spectroscopic work in places where there is no illuminating gas, as in the country and in some private houses. It is much hotter than alcohol, and, in fact, not inferior to the Bunsen gas burner in heat. Any form of constant generator can be employed, as the impurities in ordinary zinc and acid do not affect the spectrum. The gas is burned from a blow pipe jet, as a glass jet would yield faint spectra of the alkalies.

The same distinguished spectroscopist has also published a simple method for the detection of cobalt in the presence of nickel and iron. The three metals are converted into sulphocyanides by means of potassic sulphocyanide. Carbonate of soda is now added to the intensely red solution until the iron is all thrown down. The solution is then filtered and shaken with ether and amylic alcohol, in which the sulphocyanide of cobalt dissolves with a blue color. When nickel as well as cobalt are present the ethereal solution is greenish, but the cobalt is detected by characteristic absorption bands between C and D. In a mixture of 400 parts of ferric chloride to 1 part of cobaltic chloride, the latter was distinctly visible, as also in the presence of 200 parts of nickel. This test for cobalt is so delicate as to indicate the presence of 0·0000258 gr. of metallic cobalt to the cubic centimeter of solution. Sulphocyanide of nickel solutions give no absorption bands, and the sulphocyanide of cobalt in aqueous solution only shows a broad dark place in the green.

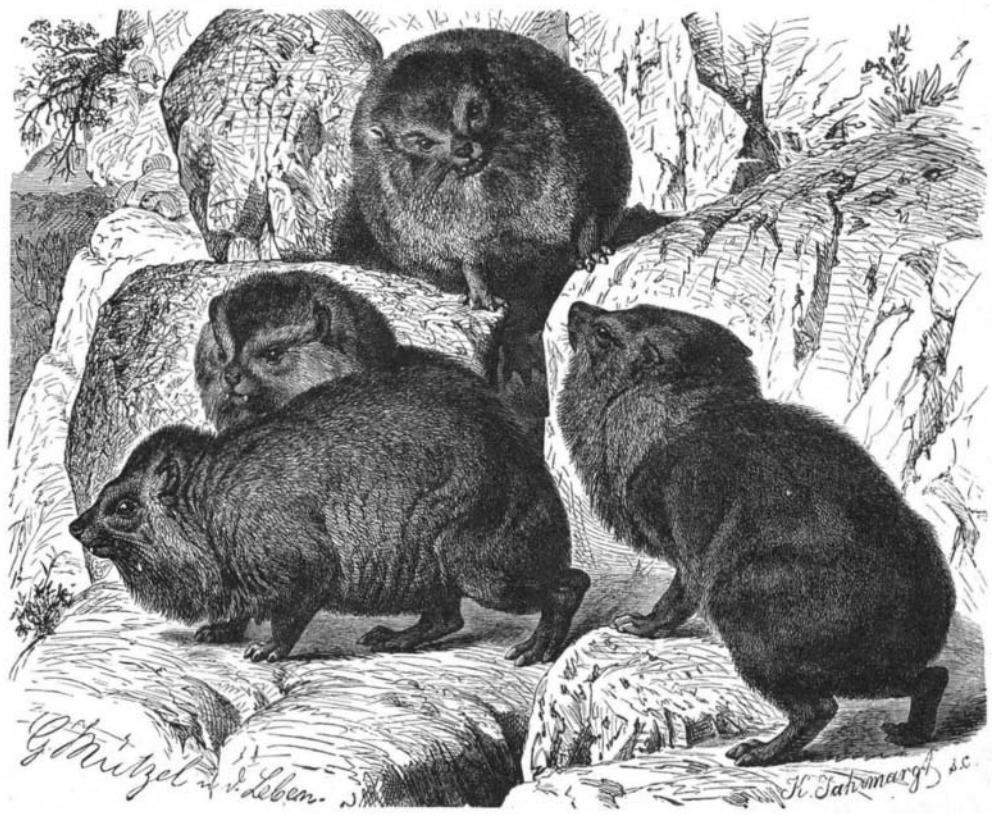
THE HYRAX.

One of the most curious little animals in existence is the hyrax, interesting not so much from its imposing external appearance, as for its importance in filling up a link in the chain of creation.

About as large as a tolerably sized rabbit, covered with thick, soft fur, inhabiting holes in the banks, possessing incisor-like teeth, and, in fine, being a very rabbit in habits, manners, and appearance, it was long classed among the rodents, and placed among the rabbits and hares. It has, however, been discovered in later years that this little rabbit-like animal is no rodent at all, but is one of the pachydermata, and that it forms a natural transition from the rhinoceros to the hippopotamus. On a close examination of the teeth, they are seen to be wonderfully like those of the hippopotamus, their edges being beveled off in a similar manner, and therefore bearing some resemblance to the chisel-edged incisors of the rodents. There are several species of hyrax, one of which inhabits Northern Africa and Syria, while the other two are found in Abyssinia and South Africa.

The South African hyrax is termed by the colonists klip das, or rock rabbit, and is found in considerable plenty among the mountainous districts of its native land, being especially common on the sides of the Table Mountain. It is largely eaten by the natives, who succeed in killing it in spite of its extreme wariness and activity. Among the crevices and fissures in the rock the hyrax takes up its abode, and may often be seen sitting in the warm rays of the sun, or feeding with apparent carelessness on the aromatic herbage of the mountain side. It is, however, perfectly secure, in spite of its apparent negligence, for a sentinel is always on guard, ready to warn his companions by a peculiar shrill cry of the approach of danger. Sometimes the hyrax is seen at a considerable height, but is often observed near the sea shore, seated on rocks which are barely above high-water mark.

Besides mankind, the hyrax has many foes, such as the birds of prey and carnivorous quadrupeds, and is destroyed in considerable numbers. The fore feet of this animal are apparently furnished with claws like those of the rabbit, but on a closer inspection, the supposed claws are seen to be veritable hoofs, black in color, and very similar to those of the rhinoceros in form. The hyrax is an agile little creature, and can climb a ragged tree trunk with great ease. It is rather hot in its temper, and if irritated becomes highly excited, and moves its teeth and feet with remarkable activity and force.



HYRAX.—(*Hyrax abyssinicus.*)

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THE PICKEREL FROG.

BY C. FEW SEISS.

The pickerel frog (*Rana palustris*, Le Conte) is the prettiest and most strongly marked of the *ranidæ* found in this section of the country. Its ground color above is pale yellowish brown, with four rows of more or less regular, squarish dark brown spots from the head to the vent. There are commonly three or four spots in each dorsal row, from behind the eye to the bend of the back (supra-iliac prominence), but in a specimen taken near Camden, N. J., these

THE PICKEREL FROG.—(*Rana Palustris.*)

spots are confluent, thus forming two blackish bands (see left-hand figure). This is the only specimen I ever saw thus marked, although I have frequently observed two spots to be confluent. The spots are always margined with dull grayish white. There are two glandular dorsal folds, one on each side of a yellowish or bronze color, but they are not so well defined as in the crying frog (*Rana clamitans*) or shad frog (*R. halecina*). The body beneath is yellowish-white; posterior part of thighs granulated and of a bright yellow color in life. The legs and feet are barred and spotted with dark brown. Dr. Gunther, in his "Catalogue of the Batrachia Salientia," gives as specific characters: "Body with *two* glandular folds on each side. Above *greenish*, with a row of squarish darker spots between the glandular folds." I have found generally but one fold, and where two do exist the upper cannot properly be designated as such. It also commonly runs through the row of spots, and not above it. I have never seen a "greenish" pickerel frog, either alive or in alcohol.

The pickerel frog is for the most part solitary in its habits, except during the breeding season. Although it is called *palustris* (marshy), it is found in springs and brooks more frequently than in low and extensive marshes. With the exception of the wood frog (*Rana temporaria sylvatica*), this is the most slender and active species we have. It will spring upward several feet to seize an insect on the wing.

I have noticed a peculiar way it has of showing its displeasure. Thus when I dropped an insect in the vivarium near two of these frogs, and the most active or lucky seized and swallowed it, the disappointed frog wheeled around and struck the object of his displeasure in the face and eyes with his tongue. And it is evident from the way the assaulted frog closed his eyes and moved away, that he did not relish such treatment.

We had a male of this species in our vivarium two winters ago, who would persist in creeping down and completely hiding himself under the moss at the approach of every cold spell during the winter.

The length of an adult pickerel frog, from nose to vent, is about 3 inches. It is found in the eastern United States from Maine to Virginia.

Distribution of Plants.

BY REV. L. J. TEMPLIN, HUTCHINSON, KANSAS.

The world is full of wonders to every one who has not made up his mind to be astonished at nothing he may see. To the thoughtful mind there is much in nature to inspire wonder and admiration. The wise adaptation of means to ends, and the beautiful harmony that exists throughout all the realm of organic nature, lead the mind, free from bias, to the inference that some wise, intelligent power orders and governs all these relations and harmonies. Perhaps nowhere in nature is there a more manifest exhibition of wisdom in the adaptation of means to the accomplishment of a worthy purpose, than is seen in the various methods employed in nature for the dissemination of plants by the distribution of seeds.

In looking at this subject with an intelligent eye, the mind cannot shut out the conviction that some intelligent designer must have been employed in planning this scheme that has so much of both excellence and variety to recommend it to the judgment. To say that all this is to be attributed to chance, is to endow chance with all the attributes of a Deity, which is the very reverse of the idea intended to be conveyed by the term. In the sense intended it is perfectly absurd to attribute this or any other work to chance, for in that sense chance is nothing, and consequently can do nothing. So we regard it as the result of evolution; but I cannot see that this relieves the difficulty, even if the truth of the theory of evolution be admitted. Evolution is simply the working out of certain results under the operation of law. But what is this law? It is not correct to say that it is force, though I think many make this mistake. Law is only the established order or manner in which force operates; so that if we admit the intervention of law and a thousand or ten thousand secondary causes, still this law must have originated with a lawgiver, and behind all these secondary causes the mind must rest at last on the first cause, the author of all other causes. But I did not start out to write a moral or philosophical essay, but to call attention to some of nature's method of distributing the vegetable kingdom over the world. In producing these results we find three classes of agents at work: the waters, the winds, and animals, besides certain arrangements within the plants themselves for the accomplishment of this purpose. And we find the seeds themselves adapted to these different means of transportation. The light character of many seeds well adapts them to floating from place to place, while their impervious coverings protect them while being carried long distances by the currents of the ocean or of rivers, and then when they lodge on some island or other shore they readily spring up and grow. What, for instance, can be better adapted to floating from island to island than the tough, corky covering of the cocoanut? The seeds of grasses and other plants are washed down from the higher grounds by streams, and they are thus widely distributed.

The seeds of many plants, as of the dandelion, thistle, and a long list of similar plants, are furnished with a tuft of downy or silky pappus, that will enable them, when ripe, to float away on the breeze and thus be scattered far and wide. The seeds of some species of poplar, as cottonwood, are attached to a bunch of fine cotton that serves as a buoy to bear them up through the air, by means of which they are frequently carried many miles from the parent tree. Seeds are often disseminated through animal agency. Animals frequently carry seeds and nuts away and bury them for winter food, where they are forgotten and left to grow.

Many seeds of fruits are swallowed by birds and carried to distant places and voided uninjured, and there spring up and grow. Thus the seeds of cherries, grapes, gooseberries, blackberries, and many others of like nature, are sown broadcast over a large extent of country. During an invasion of the Rocky Mountain locusts into Iowa a few years ago, they left the ground where they fed thickly strewn with the seeds of some species of grass, new to that locality,