feet above the top of the pipe entering the well the spouting should cease, since the pipe will then be carrying water at its full capacity with little or no air under these conditions entering the well. As a matter of fact following the heavy rains attending the storm of October 17 and 18, 1910, the lake rose several feet and the well upon being reopened received water without spouting. A similar spouting well at Albany, Ga., was described some years ago by Professor S. W. McCallie.[2]

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GRAPHITE IN VEIN QUARTZ[1]

THE writer has recently discovered a graphitic quartz in Troup County, Ga., which has some geological significance, since it is entirely unlikely that the graphite is directly of organic origin. The graphite occurs in massive vein quartz and, recognizing the already known occurrence of graphite in pegmatite and gneiss at other localities, affords additional evidence of the inorganic origin of graphite under peculiar geological conditions.

The graphite occurs in small flakes and in irregular bunches, two or three millimeters in diameter or length, disseminated through massive, clear quartz. In fact, in the specimens at hand, except for iron stains, quartz and graphite are the only components of the rock. Under the microscope, minute black crystals were noted, but the black color disappeared upon ignition, leaving the crystal form intact, indicating only a covering of graphite over minute quartz crystals. The graphite, roughly estimated, forms only two or three per cent. of the quartz at present exposed.

The nearest rock exposed in the vicinity of the quartz vein is a peridotite and it is not improbable that the vein is cutting this rock. The quartz, of course, could possibly be derived from pegmatite, but at the surface neither feldspar nor mica were found with it. The vein is evidently of small dimensions. The nearest strata of certain sedimentary origin are the Pine Mountain quartzites a few miles to the southward.

Whether the quartz was deposited from an aqueous solution or is of aqueo-igneous origin, the carbon must have been held in some form in the rock solution and the graphite deposited contemporaneously with the quartz. Its dissemination, not cavity filling, through compact, crystalline quartz is sufficient evidence that it is not directly of organic origin or derived from the metamorphism of carbonaceous matter. Perhaps the most suggestive theory of the origin of the graphite under these conditions is that it was derived from carbon dioxide (CO_2), or a hydrocarbon vapor held in the siliceous solution. The presence of carbon dioxide in crystals of quartz is well known. Smoky quartz from Branchville, Conn., yielded gas, analyzed by A. W. Wright, which contained 98.33 per cent. of CO_2.

OTTO VEATCH

CONCERNING SEXUAL COLORATION

IN the linnet of California (*Carpodacus frontalis*), after the post-juvenal (first fall) molt, the sexes are conspicuously different in color. The female is obscurely streaked beneath with hair-brown on a dull white ground, above more uniformly hair-brown. The male is usually red in color, on the whole chin, throat, malar region and chest, on the frontal and lateral portions of crown, and on the rump; otherwise the male is like the female. The linnet would thus appear to provide a good case of "sexual coloration."

After the post-juvenal molt, there is, in both sexes throughout the lifetime of the individual, but one molt annually, taking place in August. *There is no pre-nuptial molt.*

In a large series of male linnets, leaving out the occasional aberrant examples which are distinctly yellow or orange, striking variation is shown in the shade and intensity of the red. Arrangement of the component examples by date, from September to July, shows this variation to parallel uniformly the lapse of time beyond the annual molt in August. In

[2] SCIENCE, N. S., XXIV., p. 694, 1906.

[1] Published with the permission of the state geologist of Georgia.

the fresh fall plumage the red is of a dull pinkish hue (burnt carmine); there is thereafter a progressive change, slow in autumn, rapid in spring, until the breeding season finds the amorous males, bubbling with song, and going through various courting antics, arrayed in brilliant poppy red.

A nuptial attire has been donned, in the male only, but there has been no replacement of feathers; nor has there been an influx of new pigment into the feather as a former most unsound theory presupposed.

Microscopical examination of various feathers appropriately selected during the period of molt, when old and new feathers are to be found side by side, discloses the following facts: In the newly acquired, unworn plumage, the red pigment is restricted to the barbs of the contour portion of each feather, except for their terminal portions to a distance of one millimeter from their tips. These barb ends, which thus together constitute a band terminating each feather, and *all the barbules,* are white. In the extremely old, abraded (spring and autumn) feather these grayish white end portions of the barbs in the overlapping feathers, and all the barbules, have simply been broken off through attrition and lost, thus removing the grayish obscuration, and disclosing the bright red of the barbs, the tone of which has not in fact changed one whit.

Thus wear alone has accomplished the nuptial brightening of dress. A difference of structure is evident between the pigmented and unpigmented portions of the feather, the former being by far the most resistant, the latter being so adjusted in extent and texture as to become disintegrated and lost at the advent of the season of mating.

The production of color in the growing feather in August is thus clearly anticipatory; and we observe here manifestation of a most delicate structural complex, so balanced as to bring about through purely extrinsic, physical agencies, a conspicuous brightening of plumage at the season of reproduction, seven to nine months later.

The chief point to which I wish to fix attention is, that the brilliant hue of the nuptial dress is thus in reality acquired at the post-nuptial (or annual) molt, several weeks *after* the season of mating, instead of immediately preceding. This fall molt period is generally considered (as by bird fanciers and poultry raisers) to be the season of the year when the vitality of the bird is at its lowest ebb. Moreover, the organs of reproduction are at this time much reduced in size, and certainly quiescent in function. It would seem, therefore, that the production of the brilliant nuptial plumage in the linnet (and similar sequence of processes and results is well known to occur in many other passerine birds[1]) is *not* directly associated with a period of excessive sexual vigor, as a current theory postulates.

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THE OKLAHOMA ACADEMY OF SCIENCE

THE academy held its second annual meeting at the State University at Norman, November 25–26. In spite of the fact that this was only its second annual meeting, about forty papers were read, among which were the following:

"The Human Tonsillar Band as a Protective Organ," Dr. J. D. McLaren.

"Study of Lipase," H. I. Jones.

"The Physical and Chemical Changes in the Burning of Clays," L. C. Snider.

"The Road Material of Oklahoma," L. C. Snider.

"The Future Sources of Power in Oklahoma," C. N. Gould.

"A Brief History of Oklahoma Geology," C. N. Gould.

"Comparison of the Four Mountain Uplifts in Oklahoma," C. N. Gould.

"The Oklahoma Redbeds," C. N. Gould.

"The Ecology of the early Juvenile Life of the Unionidæ," F. B. Isely.

"The Unionidæ of the Red River Drainage System," F. B. Isely.

"Notes of the Experimental Study of the Growth and Migration of Mussels," F. B. Isely.

[1] See, especially, Dwight, *Annals N. Y. Acad. Sci.*, Vol. XIII., 1900, pp. 73–360.