

## The Farmer's Advocate AND HOME MAGAZINE.

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would safeguard the farmer's investment in his farm and herd, amounting, perhaps, to fifteen or twenty thousand dollars, and make him master of the situation. After a survey of the whole Province by a representative of this paper, we recommended just such action, and recent developments have convinced us that our suggestions were sound. A small plant locally owned or controlled might not alter the routine or affect farmers locally so far as the organization of their farms was concerned, but it would afford a protection for their investment in farm and herd that could not be obtained in any other way.

### Nature's Diary.

BY A. BROOKER KLUGH, M. A.

#### LUMINOSITY IN ANIMALS AND PLANTS.

The production of light by animals and plants is a commoner phenomenon than is usually supposed. In every part of the globe, in the air, in the woods and meadows, and in the waters, there are organisms which emit strange and shimmering gleams of light. Upon the surface of the ocean, sometimes over immense areas, the sea shines with a splendor which rivals the starry firmament, while in the depths of its abysses there are many creatures with light-giving organs. Plants also produce light. In the gloomy galleries of mines the mycelium of various fungi shine with a pale moonlight gleam. It is these vegetative organs of fungi which in the forests produce the so-called phosphorescence of dead wood, leaves and old stumps, and in Brazil and Australia there are species which emit an emerald light of such brightness that one can read a newspaper by means of this living torch. There are also many bacteria which produce light.

Some of these light-giving organisms have attracted the attention of man for ages and for many years scientists have been seeking the explanation of their light-producing powers. No one has done more in the investigation of these organisms than Dr. Raphael Dubois, of the University of Lyons, who has recently given some of his conclusions in "Science et La Vie." Some years ago Dr. Dubois, while working on the luminous bacteria constructed a "living lamp" which he exhibited in Paris. This lamp was composed of a convex glass vessel of which the silvered dome served as a reflector, and with an inside coating of gelatinous bouillon in which were planted colonies of the photobacteria. This lamp "burnt" for a month at a cost of two cents, and with these lamps Dr. Dubois illuminated, as with moonlight, the underground chambers of the Palace of Optics.

One of the forms upon which Dr. Dubois has worked is an insect of the Antilles known as *Pyrophora* (i. e. "the Fire-beetle"), which has three "lanterns," two on the thorax and one on the underside of the abdomen. It makes use of the first two when walking, of the third when

swimming, and all three when flying. The natives use these insects as lanterns by enclosing them in a perforated gourd, and by means of these lanterns, which are extinguished neither by rain nor wind, they carry on a sort of optical telegraphy. Dr. Dubois found that the eggs of this insect, and also the larvae, were luminous, so that in this case the phosphorescence is transmitted, like the flame of life itself, without being extinguished for a single instant from generation to generation throughout the ages.

From his investigation of this insect and of the dactylated Pholus, a marine mollusc found on the coast of France, which produces a luminous mucus, Dr. Dubois has been able to show that the generation of light by animals is due to the interaction of two chemical substances. One of these is an oxidizing agent, a ymase which he terms *luciferase*, the other an albuminous substance which he has named *luciferine*. When either of these substances is brought separately in contact with air or water no light appears, but upon mingling aqueous solutions of the two substances a very beautiful glowing light is at once produced. Dr. Dubois has further shown that various oxidizing agents can take the place of *luciferase* in bringing about the reaction, but has so far not succeeded in manufacturing *luciferine* artificially.

Dr. Dubois has not, as far as I am aware, worked upon our light-producing beetles commonly termed "fire-flies" or "lightning-bugs", but since in all the light giving animals which he has investigated he has found the same two substances it is extremely probable, if not certain, that their light is produced in the same way by the interaction of *luciferase* and *luciferine*.

The light produced by animals and plants is of a kind which man has been seeking to produce commercially for many years, that is a "cold light," or a light produced with the accompaniment of only an infinitesimal quantity of heat. Such "living light" is almost 100 per cent. efficient while the light of the most improved quartz mercury lamp is not more than 1 per cent. efficient, the rest of the energy being consumed in the production of heat and chemical action, both of which are useless and the former of which is often decidedly objectionable. Since Dr. Dubois has succeeded in isolating the compounds which produce this "living light" there seems every reason to hope that future research will result in the artificial manufacture of these substances and thus revolutionize our present systems of lighting.

### The Modern Church.

BY SANDY FRASER.

Just for a change, which is as good as a rest, ye ken, the auld wumman and I thought we'd try gaein' to a church that we hadna been in the habit o' attendin', and which Jean thinks doesna follow the Scripture in some o' its practices an' beliefs. But I tauld her that it sometimes happens that a chap will learn mair from seeing the mistak's that anither fellow makes than he will by listenin' for a week tae guid advice. We've had sae muckle o' that sort o' thing in oor lives, beginnin' shortly after we were weaned and continuing right up tae the time o' Dr. Frank Crane and oor ain meenisters last sermon, that we're gettin' a wee bit fed up, in a manner o' speakin', and it finally gets tae be like the rain that falls on the ducks back, in that it never reaches the skin.

Onyway, Jean an' I thought we'd hear thisither meenister. He's bound to be different frae the rest we've been listenin' to, thinks I, for they say that Nature never made two blades o' grass alike, and it must be the same wi' preachers.

Of course we took it for granted that we'd hear the same auld sangs an' hymns, and there's some o' them that will stand a guid deal o' repetition, I'll say that for them. There are ithers that hearing them once or twice ought to satisfy ony reasonable mon, especially gin he's a lover o' guid music. And it was a couple or three o' this latter class that we had that night. "Hark, from the tombs a doleful sound," and the likes o' that.

In one o' his prayers, that came before the sermon, the preacher asked that we all might be led tae do oor best to keep oor religion frae "deteriorating and becoming extinct." "We'll ken before we leave," says I to Jean, "how much he is dacin' himself in that line."

"I'm afraid Sandy," replied Jean, "that ye're gettin' ready tae criticize the sermon." "Sure," says I, "that's what they're for, isn't it? Are ye supposed tae shut yer eyes an' open yer mouth and swallow ilka thing the preacher hands oot tae ye? Ye'll be liable to get a guid mony queer doses o' stuff intae yer system gin ye dae that. When ye eat yer dinner ye're careful to tak' juist what agrees wi' yer stomach, an' I'm thinkin' ye'll find that the same rule will apply tae the food ye give yer mind. It's got tae agree wi' yer reason an' experience." "Whisht! Sandy," says Jean, "dae ye no' ken we're in the kirk? Gie the meenister a chance." "A'richt", I replied, "but I'm afraid frae the look o' him that he doesna ken enough to tak' it."

The sermon made up in length what it was lacking in depth, I'll say that much for it. The next had to dae wi' one o' the women mentioned in the Auld Testament and there was a chance for something guid to be taken oot o' it, especially at the present time when women are gettin' tae the top o' the pile throughout the world in general and in oor ain country in particular, where the rule o' the woman is recognized and where her word is law. Like a wee story I heard theither day about a small boy who was asked what his father's last words were before he died. "I dinna think that feyther had ony last words," replied the boy. "Mither was with him tae the end."

But the preacher didna say muckle about the women.

He seemed tae consider it a dangerous subject. He got on to it once when he started tae talk about their rights an' privileges in Bible times, compared tae noo, but the thought seemed tae strike him that he was skating on pretty thin ice and he changed the subject juist as I roused mysel' up, thinkin' I was about tae hear something. There are ony number o' guid orthodox subjects in the Scriptures an' oor friend was soon hammerin' at one o' these an' tellin' his congregation what they all believed an' what ilka one o' them had heard about a thousand an' fifty times before. He cam' tae an end at last, juist as I had given up all hope, and, after the performance o' a few mair ceremonies, he gave us oor liberty.

"Weel, Sandy," says Jean tae me on the way hame, "ye're pretty quiet, for you. Are ye sufferin' frae anither attack o' mental indigestion or are ye meditating revenge on that preacher?"

"Jean," I replied, "it's men like him that make me wish that I could talk frae the pulpit as weel as I can haul the plow or swing a scythe. Not only is he wasting his ain time but he's stealing the time o' all those people who thought it was their duty to come there to-night tae listen to him. He had an opportunity to say something and mony a man would hae jumped at it; but all he did was to keep on talking till his watch said it was time to quit."

"It's time somebody put in a kick about the kind o' sermons that are being handed oot frae a lot o' oor church pulpits in this 'enlightened age,' as they call it. Men an' women, to-day, need, above all things, practical advice in the effort we are all supposed to be making tae raise ourselves and ithers to a higher plane o' living, baith mentally an' morally. What does it matter tae me what Abraham or Moses or Paul did under certain circumstances gin those circumstances bear no relation to what I hae to deal with? What I need is help an' inspiration to tide me over the difficulty o' to-day."

"I mind o' hearin' a preacher say once that he didna believe in the preachin' o' 'daily duties.' Gin ye hae the right kind o' faith, says he, the 'daily duties' will be attended to. But experience tells us that this isn't so. It's only by continued effort that we can be true tae oor higher instincts and it is juist here that we need the help an' inspiration that can come frae a sermon preached by a mon wha is in touch wi' the lives o' his people, wha kens their difficulties, wha understands their temptations and can sympathize wi' them in their sorrow."

"Oor churches are not drawing the people intae them to-day as they should. And why, can ye tell me? Is it no', perhaps, because these same churches are no' supplying the moral an' spiritual needs o' the world? When we go tae the toon and find that we can't get what we want in one store we juist naturally turn tae anither where we can. Sae is it wi' the world in general. It canna mak' use o' the shop-worn, second-hand material sae mony o' the churches are still tryin' tae hand oot and it is ceasing tae patronize them."

"Gie us men in oor pulpits wha are no' afraid to tak' the unbeaten path that leads frae dreamland oot intae the life an' activity o' every-day existence, and who will be leaders o' their fellow-men, inspiring them by word an' example to higher ideals an' better lives. Then, an' no' before it, will the church be fulfillin' her true mission on earth and takin the place that belongs tae her, by right, in the spiritual life o' the nation."

"Amen," says Jean, who had listened tae me langer than usual wi'oot interruptin'. "That mak's twa sermons that I hae had the benefit o', to-night. Ye're an auld man but a young preacher, Sandy. Onybody can see that. But na doot yer high ideals for the Church will become a reality some day or ither, even gin we dinna live tae see it ourselves. Changes are unco' slow in comin' in this world, and nowhere dae they come slower than in the Church, but Revolutions an' Reformations may cut a figure in the history o' the future as weel as they have in that o' the past. But here we are at hame, Sandy, sae get awa' tae bed an' forget it. You hae tae start silo fillin' in the mornin, ye ken."

### A Clear Field for Fall Fairs.

With the big fairs cleared away or drawin' to a close in the various Eastern Provinces, the field is now open for the district, township or county fairs, which are the order of the day. They can be made abundantly useful if properly managed and patronized by the people within their sphere of influence. If left solely to the secretary and directors without support these small fairs become a local holiday and nothing more. They should be made a community affair and all should do their part. A great many can exhibit; others can assist in putting the grounds into condition and giving their services on fair day. Too many feel that the town people are running the fair, and consequently hesitate to take any active part or offer their services. In many cases the town people do operate the fall fairs because farmers are not sufficiently forward in taking part and assisting. This is one event where town and country can get together advantageously, and a get-together meeting prior to the fair would be a splendid thing to harmonize all the various departments and make each official and his helpers feel the responsibility imposed upon them. Grants, in themselves, can never make a fair. Enthusiasm, assistance voluntarily offered, and willing hands are the greatest factors contributing to the success of a fall fair.