

oldest life upon earth. Other forms of life have appeared and disappeared. Species, groups, classes, have developed and become extinct. This form of life has remained changing only the style of house in which it has lived from what the first chapter of Genesis calls the "fifth day" until now. Dr. Dawson's discovery was not the animal itself but the old-fashioned house in which one of these animals had lived. We find them today in both fresh and salt water, living in an almost infinite variety of houses, and some of them—the amoebæ—without any houses at all. For an idea of the variety and shapes of the fresh water forms, I can only refer you to your public library, where you may find Professor Leidy's work on Rhizopods. Remember, too, that they are all microscopic.

The salt water forms generally come under the head of what are known as Foraminifera. Professor Carpenter's work is an authority on that subject. Foraminifera are really but rhizopods who live in certain styles of houses. In the ocean they build their wonderful tenements, either from minute sand-grains or from the lime held in solution in the ocean's water. The sand forms are curious and interesting but the most beautiful and complex are those of lime formation. By just what process this lime is formed into cases of such marvelous shape, or why they should be so delicate and intricate, is wholly a matter of speculation. The most abundant family of this period is the Globigerina. They are found wherever ocean soundings have been made. If, during a voyage to Europe, a sufficiently fine net be dragged through the water, they would be taken in countless numbers. Under the microscope they appear as a cluster of minute globules of graduated sizes, increasing in dimension from the centre outward, and of somewhat irregular, though always rounded, shape. Their aggregation forms a spheroid. These globes are but chambers serially connected, which mark the growth of the inhabitant. Beginning with its first abode—a single cell—as the rhizopod finds its quarter too limited for its growth, it projects a portion of its body through the door of its house and builds an extension. As it continues to grow it adds chamber after chamber, each larger than its predecessor, and lives in them all. The general plan of arrangement is a coil. The chambers are rarely more than sixteen in number. After that the excess of body matter detaches itself from the main portion to form a new organism with an establishment of its own. As the globigerina increase in size and weight, they sink to the bottom. There with the shells of those whose lives are lived on the bed of the ocean, their little houses after the death of the rhizopod tenant, form a large percentage of the ocean mud. It is estimated that no less than ninety seven percent of what is called "ooze," brought up by dredging in the North Atlantic Ocean, is composed of these tiny shells. Of the thickness of the globigerina mud-bud we cannot even guess.

Another very important branch of the Foraminifera family is the Nummulites, which, although less frequently found in our day, was in past ages so prolific that their remains may be said to belt the earth's northern hemisphere with an irregular girdle, which has in some places a width of 1,800 miles and an unknown thickness. They are much larger than the globigerina, and in beauty of design and general complexity of structure are among the most marvelous of all the foraminifera. In size they vary from one sixteenth of an inch in diameter up to gigantic specimens of rare occurrence that are four and a half inches, the average being one-half to one inch. Most of them are circular in form, with more or less convex or rounded sides. Their general arrangement is a series of cells or chambers having curved partitions and forming a coil. Starting from a central cell, other cells are, as with the globigerina, built, one at a time, to provide for the growth of the inhabitant, of gradually increasing dimensions, each addition larger than the one preceding it, with geometrical precision. To attempt a description of the interior arrangement of most of the nummulites is only to be baffled by a lack of words with which to picture the complexity and dainty grace of the lines of their structure, the exquisite relative proportions of the successive chambers, and the amazing system of canals which pass throughout the walls and by which nutriment is supplied to the parts inhabiting the different cells. Many of the things which can be seen through a microscope cannot well be shown through an inkstand.

Of the countless millions of billions of these creatures that have lived and built for themselves marvelous houses the human mind can have no conception. To know what becomes of them all we must first realize that much of what is now dry land was once the bed of the ocean. Deeper excavations of the globigerina mud of the North Atlantic show that the shells, by disintegration and decomposition, have formed into a material so resembling chalk as to warrant the conclusion that the chalk beds of Europe are but deposits of these shells, combined with a small percentage of other material. This is verified by subjecting the chalk formation to close microscopical examination. It is also certain that nearly all of our marble is but the result of chemical changes in deposits of these structures. Some marbles show very distinctly undecomposed shell-forms which are recognized as globigerina and nummulites. The stone from which much of the city of Paris is built consists almost entirely of foraminifera called the Miliolida. The stones used for the construction of the pyramids of Egypt are the fossil formation of some of these

shell houses. All over the world are found beds of limestone, some of which have been extensively worked, which the microscope shows to be composed of the remains of nummulites and fusulina. Thus we see that no inconsiderable portion of the solid part of the earth's substance is but the result of the life and death of these marvelous creatures. Useful in their lives in making and keeping the water of old ocean just what the Creator intended it should be, at their death they leave a legacy of the houses in which their little lives were lived to us who from the ruins of theirs, build some of the houses in which our lives are lived. Great indeed are the works of man—the result of his God given intelligence; great and wonderful the Taj Mahal and the Alhambra; great the skill of Brunelleschi, of Giotto, of Michael Angelo and Sir Christopher Wren. But their works are the works of men, and suggest little save man's greatness. In the work of some of these animals placed in our catalogues among the lower order of creation, we can find no suggestions save of the Father of Him who said, "In my Father's house are many mansions."—Outlook.

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## The Struggle of the Soul.

BY JAMES BUCKHAM.

A student of insect life once found the curious flask-shaped cocoon of an emperor moth, and kept it in her room in order that she might observe the emergence of the beautiful creature. At length, when nearly a year had passed, she discovered signs of the embryo's awakening. During a whole forenoon she watched the efforts of the moth to escape from its prison. There was just one narrow opening in the neck of the cocoon through which the insect must force its way, an opening so greatly disproportionate to the size of the embryo that the struggle seemed to the watcher almost hopeless. When it had been protracted for hours her sympathy so roused that she seized a pair of scissors and snipped the confining threads, to make the exit of the embryo easier. Immediately the moth emerged, dragging a huge, swollen body and little shrivelled wings. "In vain," says the observer, "I watched to see that marvellous process of expansion in which these wings, in the normal embryo, silently and swiftly develop before one's eyes and as I traced the exquisite spots and markings of divers colors, which were all there in miniature, I longed to see these assume their due proportions, and the creature appear in all its perfect beauty, as it is, in truth one of the loveliest of its kind. But I looked in vain. My false tenderness had proved its ruin. It never was anything but a stunted abortion, crawling painfully through that brief life which it should have spent flying through the air on rainbow wings."

In artificially enlarging the passage through which the insect was struggling to emerge, the observer had interfered with a provision of nature by which the fluids necessary to expansion and coloration are forced into the vessels of the insect's wings. These in case of the emperor moth, are less developed at the period of emerging from the chrysalis than are those of most other insects. The severe and prolonged struggle of emergence from its cocoon is absolutely necessary to the emperor moth in order that it may realize its normal and beautiful development, its fullness of life. Deprived of this struggle, it must remain a stunted and distorted creature while it lives, crawling instead of flying, ugly instead of beautiful, pitifully cheated out of its birth-right, and condemned to a brief existence of helplessness and misery.

Is not this one of those marvellous correspondences between the natural and spiritual world, by which we are taught the identity of the laws that govern both these great provinces of the Creator? The law of spiritual development—is it not the same in the life history of the emperor moth? The soul, too, must have its struggle with environments, with the trying conditions of life in this present stage of existence, in order that it may emerge perfected and beautified, its celestial wings expanded and made radiant by the life currents which only stress and suffering can cause to flow through them. That is the divine, the inevitable condition of soul-growth. "No sparing men the process," as Browning says. Just as surely as the soul is cheated of its struggle, deprived of its opportunity of meeting and overcoming the hard conditions of life just so surely it loses its birthright of divine expansion and beauty, of developing into the likeness of Christ's perfect humanity.

May we not see, then, that it is a false benevolence, nay, a cruel and harmful wrong to any soul, one's own or another's, to cut for it the God-appointed fibres of discipline, that it may pass through them without that struggle that shall spread and irradiate for the spirit its celestial wings? Ah! the misguided charity that would lift from another's shoulders the burden that would steady him through life, that would develop and strengthen him, and make him eternally more manly and more angelic! There are burdens that should be shared; there are even burdens that should be entirely lifted and carried by another; but there are no spiritual burdens which the soul is called upon to bear as tests and disciplines which it should be denied the gracious privilege of bearing.

"To suffer is divine," says Whittier. Yes, divine in its influence and divine in its result. The struggle of the soul is a struggle of redemption, a struggle upward and

Godward. It is the struggle of spiritual evolution. In no other way can the soul attain fullness of life, emancipation from the finite, communion and fellowship with God.

Then welcome each rebuff  
That turns earth's smoothness rough,  
Each string that bids not sit nor stand, but go!  
Be our joys three parts pain!  
Strive, and hold cheap the strain;  
Learn, nor account the pang; dare, never grudge the throe.  
—Young People

## Jacob's Sermon.

"Had a good sermon, Jacob?" my wife asked me last night when I came home from church.

"Complete, Rachel," said I.

Rachel was poorly, and couldn't go to meeting much, so she always wanted me to tell her about the sermon and the singing and the people.

"Good singing, Jacob?"

"I'm sure I couldn't tell you."

"Many people out today?"

"I don't know."

"Why, Jacob, what's the matter? What are you thinking about?"

"The sermon."

"What was the text?"

"I don't think there was any. I didn't hear it."

"I declare Jacob, I do believe you slept all the time."

"Indeed I didn't. I never was so wide awake."

"What was the subject, then?"

"As near as I can remember, it was me."

"You! Jacob Gay!"

"Yes ma'am. You think it a poor subject. I'm sure I thought so too."

"Who preached? Our minister?"

"No he didn't preach—not to me, at any rate. 'Twas a woman—a young woman too."

"Why, Mr. Gay! You don't mean it surely! Those woman's rights folks haven't got into our pulpit?"

"Well not exactly. The minister preached from the pulpit, but I could not listen. I was thinking about my sermon. I will tell you about it. You know that young woman at the post office, Mrs. Hydes niece. She and I were the first ones at meeting, and we sat by the stove warming. I had seen her a good deal in the post-office and at her aunt's when I was there at work. She is a pleasant spoken and a nice pretty girl. We were talking about the meetings. You know there is quite a reformation going on. She was speaking of this one and that one who was converted. There was quite a silence, and then she said, sort of low, and trembling in her voice, and a little pink blush on her cheek, and the tears just starting:

"Oh, Mr. Gay, some of us were saying at the prayer-meeting, last night, that we did so want you to be a Christian."

"Her cheeks flushed redder, and the tears fell. I knew she felt it, and it was a cross to say it. I never was so taken back in all my life."

"Why, bless your soul! I said, 'my child, I have been a member of the church forty years.'

"My tears came then, and I guess my cheeks would have been redder than hers, if they warn't so tanned."

"Do excuse me Mr. Gay," she said. "Excuse me for hurting your feelings, but I didn't know you were a Christian. I never see you at prayer-meeting or Sabbath school, and I never notice you at communion. I'm sorry I've hurt your feelings."

"I'm, tut, child, I answered. No harm done. I'm glad you thought about an old man. I'm a member as I said, but I haven't worked at it much, I'll allow. I don't go to prayer-meeting or Sunday school because—well—I made the excuse to myself and other folks that Rachel was poorly, and needed me to stay with her, but I'm afraid the Lord wouldn't accept it."

"Just then the people began to come, and I took my seat but the looks and words of that young woman went to my heart. I couldn't think of anything else. They preached to me all the meeting time. I think that some of the young people in Wharton didn't know I was a member, were concerned for the old man! I said to myself, by way of application, 'Jacob Gay, you've been a silent partner long enough. It is time you woke up and worked for the Lord; time to let your light so shine so that the young folks can see it.'—Golden Rule."

## Suppose.

BY HENRY VAN DYKE, D. D.

Suppose that the Christian life, in its daily manifestation, should come to be marked and known by simplicity and happiness. Suppose that the followers of Jesus should really escape from bondage to the evil spirits of avarice and luxury which infect and torment so much of our complicated, tangled artificial modern life. Suppose that, instead of increasing their wants and their desires, instead of loading themselves down on life's journey with so many bags and parcels and boxes of superfluous luggage and bric-a-brac that they are forced to sit down by the roadside and rasp for breath, instead of wearing themselves out in the dusty ways of competition and vain show, or embittering their hearts because they cannot succeed in getting into weary race of wealth and fashion—suppose instead of all this they should turn to quiet ways, lowly pleasures, pure and simple joys, "plain living and high thinking." Suppose they should truly find and clearly show their happiness in the knowledge that God loves them, and Christ died for them, and heaven is sure, and so set their hearts free to rejoice in life's common mercies, the light of the sun, the blue of the sky, the splendour of the sea, the peace of the everlasting hills, the songs of the birds, the sweetness of flowers, the wholesome savor of good food, the delight of action, the charm of music, the blessings of human love and friendship—rejoice in all these without fear or misgiving, because Christ has sanctified them all by his presence and touch.—Sel.