

The Core of the Earth

HIDDEN MYSTERIES OF THE DEPTHS.

(By PROF. ARTHUR THOMSON.)
Diverse pictures have been given of the interior of the earth: which of them has most basis of fact? The difficulty is in part the indirectness of the evidence, for the deepest borings are but as minute pinpricks on the skin of an orange, as 1 to 2,500! One of the very deepest mines at Johannesburg takes the visitor quickly down about 6,000 feet to near the level of Cape Town, but what is that compared with the earth's radius of, say, 3,950 miles. Until enormously deeper borings are made, our surest knowledge of the earth's interior must be indirect.

Science as science cannot even think of the beginning, but it knows a little about some of the many beginnings. Thus as regards the earth, if we ask how it began, the accredited answer is that it consolidated from a nebular mass. And if we ask where the nebular mass came from, one of the ingenious answers is that it was drawn off from the once immensely larger sun by the attraction of a passing star! Be this as it may, we must see the young earth as a whirling nebular mass, drawing into its gaseous substance a rich catch of meteor-like bodies and planetesimal fragments, and settling down into a molten sphere great heat being generated by the impact of the contributions that made the earth grow. There is much to suggest that when the earth finished growing it was molten.

Then followed ages of cooling and a gradual zoning into a metallic core rich in iron, like the crucible of a blast furnace, and outside that hundreds of miles of silicate rocks; and outside that again a more siliceous and lighter outer layer, froth fifty to seventy-five miles in thickness. As the cooling continued the outer layer divided into a universal granitic crust above, and a thicker basaltic shell below. The viscous inner shell of lighter basic rock, akin to basalt, was called, by the great Viennese geologist, Suess, the "sima," a word made up of the first letters of silica and magnesia, which form a great part of heavy basic rocks. On the surface of the sima, like a sugar crust on treacle, floats a thinner skin of sial, principally composed of silica and alumina, which predominate in acid crystalline rocks, like gneiss and granite. The sima forms the floor of the oceans which, on Wegener's ingenious theory, are due to great rifts in the sial and subsequent drifting apart of immense continental masses.

As for our familiar sedimentary rocks, like sandstone and limestone, so interesting in many ways—as regards scenery, soil-making and fossils—they are the results of the endless scrapping and rebuilding of parts of the superficial sial, and form but an insignificant part of the earth's crust.

Thus we may think of the earth with (1) a dense metallic core, (2) hundreds of miles of heavy silicate rock, (3) the viscous sima, (4) the floating silica, and (5) the sedimentary rocks.

The scientific evidence points to the truth of Tennyson's words: "The solid earth on which we tread, in tracts of fluent heat began." It seems that the earth, like the other planets, passed from a gaseous state to a liquid state by the loss of heat radiated from the outside into space. From the liquid or molten state there was a gradual passage into solidity by continued cooling from the surface. But even after solidification of the crust a long time would have to elapse before the surface became cool enough to allow of the condensation of water-vapor. And only after the water-circulation got going, e.g. in the sequence of cloud, rain, streamlet, river, and sea, would there begin the weathering of the surface and the re-disposing of materials which led to the earliest sedimentary rocks.

There has been considerable difference of opinion among authorities in regard to the present state of the earth's core. It is a fiery furnace full of molten iron and other metals, or is it a relatively quiescent, though very hot, solid mass?

The trend of the evidence is towards the second conclusion. In the original cooling of the earth the first solidification would be a superficial unstable crust, contracting as it hardened and breaking into pieces which sank down again into the molten mass. They would be re-melted; new crust would be formed; and so the process would go on until the surface layers of the internal mass had used up so much of their heat that they could not melt any more. As the cooled crust thickened by contributions from below, as an ice-sheet on a pond from the water, there would be less and less out-passage of heat from the core, and the surface would come to depend mainly on the sun for its warmth. But it is well known that the temperature in deep mines is appreciably high, and at depths below fifty miles the temperature must be not far from that at which the rocks melt.

Still more must this be true of a depth of three hundred miles. But it has to be borne in mind that the compression of the internal regions by the load they bear raises the melting point. Moreover, the students of ideas and earthquakes tell us that the earth as a whole behaves as if it were made of steel, and cannot possibly have a

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fluid zone beneath its crust. It seems metallic iron, also solid. We have, of course, only touched the question, giving solid, though not yielding, and that ing what might be called an ordinary citizen's answer.

Very tender gingerbread can be made with pastry or cake flour. With the coming of hot weather, less meat is required in the diet.

When eggs are used in gingerbread the texture is improved. Serve cream of spinach soup with grated cheese and croutons.

Pit cherries with a new stub pen point inverted in the holder. Gingerbread muffins require more liquid than a loaf of gingerbread.

Hot chocolate or lemon sauce is nice served with hot gingerbread. Very handy in the kitchen is a grapefruit knife of stainless steel.

SNOODLES

He Didn't Discover The Desired Directions.

By CY HUNGERFORD



Just Folks

By EDGAR GUNTER

"THAT'S LIFE." They tell me sin and shame and so are hurt and hate. Some cruel passion unconquerable true to life, they state. But as they glorify the base and the vice they find, I hold 'tis human to be clean and man to be kind.

The honest man is true to life, though cynics scoff him. He is the pride of every state, strength of every town. Though sin and shame and hate here, the virtues fine and true, Deserve the critic's phrase "life!" for they are human.

There is a thorn upon the rose, all the world would score. The man who missed the lovely and painted but the thorn, I see in countless merry homes, happy man and wife. Their children romping, round the door, and that I say is "life." This thing called life is not a struggle for vice and sin. Life is a circle wide which takes struggling mortals in. And though to err is human, long have understood, It's just as human to be clean, true, and kind, and good.

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Mrs. Lillian Langtry

(By P. W. LUCE)

The unofficial announcement Mrs. Lillian Langtry has been stored to royal favor as a rare having written her memoirs with a remarkable woman once more in limelight. It is now well over a century since she first started world with her beauty, talent, disregard of established customs. As "The Jersey Lily" of the day and "Mr. Jersey" of the day.

Mrs. Langtry has been a publicity agent for her island in the English Channel, but from never enthused over her. There have been rare and white tentation. Jersey is decidedly common and has not yet recovered from shock it sustained when Lily became an actress. Her father, Le Breton, held the most important office in the gift of the Channel Islands in the ancient Duchy of Normandy, and it was incredible a dean's daughter should have become a white light that beats on stage.

The last occasion on which Langtry visited her old home about twelve years ago. Her time was spent on the sea catching crabs and fishing. sionally she got up as early as o'clock in the morning to take advantage of the tides.

During this holiday the actress herself started a career over her age. Some of her were rather tactless and rude, say's leading daily paper, which signed a reporter to check up Langtry's statements with the records.

This is the story he wrote: "A lady's age is hardly a matter for public discussion, but Langtry persistently insists this. We therefore sought confirmation from official documents."

"At the last moment, however, reporter had qualms of conscience. He could not bring himself to utilize the birth certificate of Le Breton's daughter. We accept Mrs. Langtry's word at present age. At the same time must call attention to an error paralleled in British history: reporter carefully examined the documents relating to the marriage of Lily Le Breton to Edwin Langtry, and found that this occurred about a year before the lady had reached her birthday—assuming, of course, Mrs. Langtry remembers her correctly."

That ended the discussion.



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