nounced the appointment of Dr. Robert A. Lambert as professor of pathology and director of the School of Tropical Medicine in Porto Rico; Dr. Nathaniel R. Norton as professor in the department of diseases of children, and Drs. William C. Johnson and William C. Von Glahn, assistant professors of pathology to be associates in that department.

DISCUSSION AND CORRESPONDENCE

THE KENNELLY-HEAVISIDE LAYER

IN connection with the transmission of electric waves, we now hear much concerning a reflecting atmospheric layer some forty kilometers above the earth's surface, and quite generally known as the Heaviside layer. It is not so generally known that Professor A. E. Kennelly announced the probable existence of such a layer prior to its announcement by Oliver Heaviside. The latter some time in December, 1902, in Vol. XXXIII, tenth edition, Encyclopedia Britannica, in an article on telegraphy, suggested a conducting layer in the upper air.

Kennelly published his paper "On the elevation of the electrically-conducting strata of the earth's atmosphere" in the *Electrical World and Engineer,* New York, March 15, 1902. It deals directly with the problem of long distance wireless wave transmission, and includes a remark which is of significance to aerographers; namely, that

> As soon as long distance wireless waves come under the sway of accurate measurement, we may hope to find from the observed attenuations, data for computing the electrical conditions of the upper atmosphere.

An interesting sidelight on the matter is the remark of C. Bouthillon, in *L'Onde Électrique,* June, 1923, where, in a critical review of the theory of propagation of these waves, it is stated:

> Le premier savant qui ait précisé l'idée est Kennelly, qui, dès 1902, fixait à 80 km. environ la hauteur de la coche refléchissante. Vers la même époque, O. Heaviside, Henri Poincaré, A. Blondel, Ch.-Ed. Guillaume, émettaient des hypothèses semblables.

This layer is destined to play an important part in future studies of the stratification of our atmosphere, especially at great heights.

I have in some lectures compared the atmosphere to a six-story building.

The first story, with ground floor, is the troposphere, in which the temperature falls at a fairly constant rate with elevation. This story is not of equal height around the world, but bulges up near the equator and slopes down near the poles. In our latitudes the ceiling is about 10 km (6 miles) above the floor. There is a mezzanine gallery about 0.5 km above the floor; and just as in the big buildings we are familiar with, the accounting offices are placed here. Notwithstanding those who regard variation in solar radiation as the source of weather and take the elevator to the roof, we will continue to do business and settle our weather accounts at these offices on the lower floors.

The second floor is the stratosphere, discovered and named by Teisserenc de Bort. The temperature gradients are horizontal instead of vertical. There are no clouds on this floor.

Somewhere about 40 km high is the third story; and in all probability this will be found to be the Kennelly-Heaviside region.

As yet the floor and ceiling are conjectural.

The fourth floor is the domain of meteors—and if we are to follow recent estimates, the temperature is actually warmer than in the mezzanine offices thirty-six miles below. This also is conjecture.

The fifth floor is the old top of the atmosphere—the twilight arch region, which comes out by triangulation about 80 km, but is more likely 65 to 70 km because of refraction errors.

The sixth floor is the region of auroral displays. The upper edges of auroral arcs according to Störmer are as high as 150 km; but the rays go still higher, often to 300 km.

The sixth story is also the roof. All above we call the Empyrean and turn the space over to astronomers.

So it seems that our six-story airshell is not such a skyscraper, after all. If we represent the distance from the earth's center to the surface by 1,000 bricks laid end to end, then the thickness of the sensible atmosphere could be represented by one brick. The highest level yet reached by man would need a trifle more, the highest actual record obtained by man would need about six bricks; and to reach an aurora sixteen bricks would be needed.

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MUSICAL ECHOES

SOME time ago there appeared in SCIENCE an interesting article on "Musical echoes." The author of the article might be glad to have his attention called to another example of such echoes reported in the April number of *Blackwood's Magazine,* on page 469, "In Lapland," by Jan Gordon and Cora J. Gordon.

> Under the high and purplish cliffs of the other side of the lake, we had a peculiar experience in acoustics; the clatter of the motor was gathered up and reflected back by these scarped rocks in a hundred echoes, but by some strange trick blended in so peculiar a fashion that the vulgar rattle and roar came to us sweetened into the chiming of cathedral bells, pastoral England's Sunday morning unbelievably imitated, now surging louder, now

drifting fainter, as one would hear the bells themselves in a shifting breeze.

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A HISTORIC FOSSIL

BOTANISTS and paleobotanists will be interested to hear that I have just received through an extraordinary courtesy of the custodians of the Zwinger Museum of Dresden a wedge cut from the historic cycadeoid *Raumeria Reichenbachiana*. This great petrifaction was first observed near Lednice, about three miles from Wieliczki in the salt region to the southeast of Cracow, in the year 1753. It was sent to Dresden by an engineer named Borlach in 1755, and thus has a longer museum history than any other cycadeoid. It is also the finest of all European trunks, and in fineness of structure is not surpassed by any American species. The true horizon is not yet known; but the trunk, along with the Silesian Raumeria Schulziana, must pertain to some horizon in the Galician Carpathians about equivalent to the Como or to the Lakota of the Black Hills.

The wedge was cut under the supervision of Dr. R. Kraeusel at Frankfurt am Main. It is ample for all study and comparison with the American and European forms. It carries nine complete floral axes, including the world-famous flower-bud illustrated by Goeppert in 1853, but, as so often happened with the cycadeoids, never studied. Paleobotanists will appreciate the fine discrimination shown by Dr. Kraeusel in taking his own initiative in cutting the wedge surface exactly to plate size for quarto illustration, while Americans may generally feel a deep satisfaction that an American laboratory has been entrusted with the investigation of this unique and famous fossil, certainly one of the three most celebrated fossils ever to reach this country from Europe.

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A PHILIPPINE RORQUAL

A LIVING specimen of the small sharp-nosed rorqual, *Balaenoptera rostrata* Gray, 32 feet long, was captured in Manila Bay, having stranded near Bacoor, Cavite Province, January 3, 1925. The animal died that afternoon and was hauled out on shore. Some speculative Filipinos paid 400 pesos for it, thinking to make a fortune by having it mounted for exhibition purposes. When seen by me about the middle of the forenoon of January 5th it was in an advanced state of decomposition, and the outer layer of skin was peeling off badly. The whale was shiny black above and much darker than given by Beddard in "A Book of Whales." The black faded to grayish black and dirty gray on the sides and posteriorly; the plaited folds of the throat and belly were yellowish white. The long shaggy bristles of the baleen were gray. The animal was a male and the pressure of the gases of decomposition forced out of the body the rigid penis. This organ was slender, rather pointed and small for so large an animal, being about 14 inches long. No parasites were found on the skin or in the mouth; it is probable that the brackish water in which the whale was kept at first had killed any parasites present and they had dropped off. This is the first record of this mammal from the Philippines.

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LEGISLATION ON THE TEACHING OF EVOLUTION

THERE appears in the recent translation of Kammerer's "Inheritance of Acquired Characteristics," by A. Paul Maerker-Branden, the following statement:

> Unfortunately, the so-called "fundamentalists," led by William Jennings Bryan and clergymen of different denominations—it seems unbelievable, but it is the sad truth—have succeeded in excluding evolution of man from the curriculum of the schools of North Carolina and Kentucky.

This statement is in part, at least, erroneous. Both of these states have recently had bills presented in the legislature to prohibit paying the salary, from state funds, of teachers presenting the theory of evolution as a fact. In each case the bills were defeated; in North Carolina by a vote as reported by newspapers of 64–46. Furthermore, the matter was voted on in North Carolina after the publication of this book. The vote in Kentucky was taken a couple of years ago and was closer.

This statement is made in order to "keep history straight."

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SCIENTIFIC BOOKS

Genetics and Eugenics. By W. E. CASTLE. Cambridge, Harvard University Press, 1924, viii + 434 pp.

A THIRD edition of Castle's "Genetics and Eugenics" is an event worthy of more than passing notice, especially since the new edition contains so much new matter. A new part has been added, devoted to the biological basis of genetics, which helps orient the reader concerning such fundamental matters as the cell, cell-division, reproduction (asexual and sexual), chromosome reduction and gametogenesis, variation in chromosome number, the chromosomes and