for them to rest in. The torpedoes will be carried by the Maine, the torpedo boat being able to carry only a single one at a time, which will rest in her tube. The role of action will simply be to get under way with the torpedo ready, then to approach the enemy as close as possible, to discharge the torpedo and run. Her side plates in places are but $\frac{3}{32}$ of an inch thick, so that she will be practically unprotected.

The crew includes the commander, engineer, firemen and two sailors. The Whitehead torpedo, which is used, weighs rather more than 2,100 pounds, so that stability as well as a measure of protection to the machinery is secured by placing the weights as low as possible. Thus the engine cranks in their stroke work down between the frames almost to the bottom of the vessel.

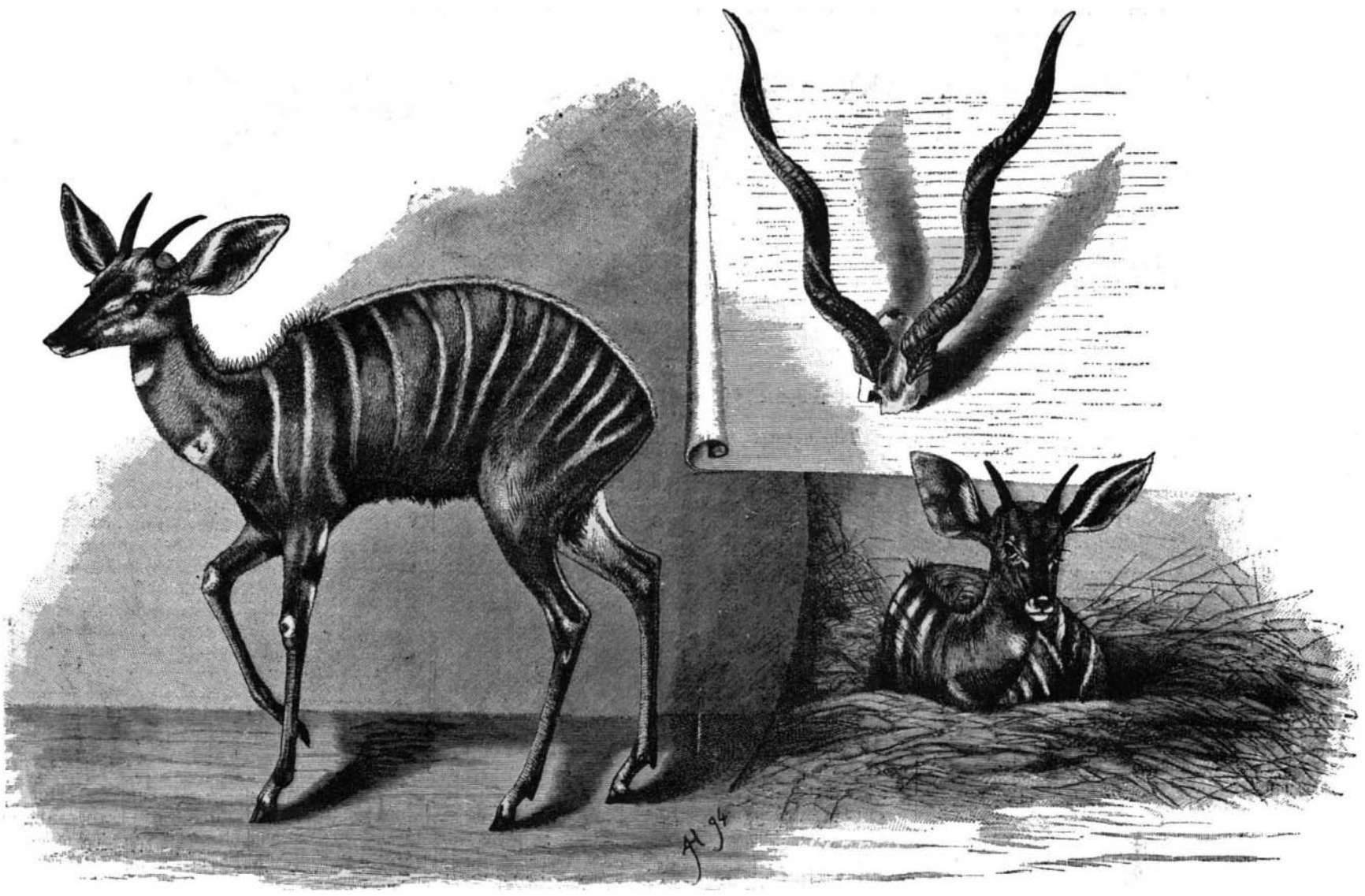
The results of calculations for stability are as follows: At nominal condition, ready for service, with ammunition, torpedo and crew of five men on board:

Metacentric height (feet)	1·55
Angle of heel at maximum stability (degrees)	43
Righting moment at maximum stability (ft. lb.)	27,135
Angle of vanishing stability (degrees)	89

In peace the boats will be used as dispatch boats, and will be undoubtedly very serviceable.

THE LITTLE KOODOO ANTELOPE IN THE BERLIN ZOOLOGICAL GARDEN.

Since the closing of the Soudan by the marauding excursions of the Mahdists, the trade in the exportation of African animals has suffered greatly, so that living giraffes are now counted among the most costly rarities in zoological gardens; but recently Mr. Menges, the dealer in animals, penetrated into that almost unknown region, Somauli, under the guidance of a native hunter. His discoveries tend to show that there is a marked difference between the animals of this region and those of the other parts of the Dark Continent. This difference is illustrated by our engraving, which shows a dwarf of the beautiful Koodoo antelope, which were so numerous on the steppes of Eastern Africa before the invasion of the devastating murrain. The little Koodoo antelopes differ from the larger species in the coloring of the body, which is grayer, with more light bands, and in the absence of the tuft of hair from the throat. They live on the banks of the rivers that flow into the Indian Ocean, going south as far as Tana, and west as far as Lake Baringo, preferring the thick, thorny bushes on the overhanging banks of the rivers and brooks. Here they live in small families, which are led by a buck that is generally dark colored. Our engraving shows a young male in two characteristic positions. The horns of the full-grown animal, which are shown, are very similar to those of the large Koodoo antelope. —Illustrirte Zeitung.



THE LITTLE KOODOO ANTELOPE IN THE BERLIN ZOOLOGICAL GARDEN.

Baldness.

The cause of baldness in man is said by Dr. Leslie Phillips to be the fact that he cuts his hair. He says: "In men the hair is habitually cut short from childhood, while in women the converse is almost universally true. In boyhood and manhood, by clipping or cutting the hair, we remove the gentle traction on the bulb and follicle which the natural weight of the hair exercises, and which constitutes the essential and natural stimulus necessary to secure due innervation and vascular supply to the hair-producing structures. Loss of vigor, and finally more or less pronounced atrophy, is the inexorable result, modified or delayed, it may be, by collateral circumstances, predispositions, or conditions." Dr. Phillips warns the "new woman" against wearing her hair short. Almost every theory has some defect, and we might ask Dr. Phillips why men who clip their beard or shave for a long time do not get bald on their chins?—Medical Record.

Up-to-Date Photographs.

Being photographed nowadays is an elaborate process. Heretofore, when a woman wanted her photograph taken, she went to the studio and arranged about the size of the picture and the number she wanted. She gave a reassuring touch to her hair, sat down before the camera, turned her head a little to the right or to the left, as the artist desired, and, clamped on either temple, gazed fixedly, insipidly or otherwise, at a spot on the wall. Now the subject's "possibilities" are studied in detail. Nothing is left to accident. The fashionable woman carries her various gowns to the studio with her, and tries them on, each in turn, that the artist may decide which suits her best. She pays $50 for the photographs.

Her hair is arranged by skillful hands in different ways, that a style of coiffure may be chosen which will be appropriate, not only to the contour of her face and head, but to the environments of the picture. The subject's hands and arms are criticised, likewise her throat and neck, to see whether a severe high costume or an evening gown shall be used. The topics of backgrounds and accessories are discussed.

All of these tinted carbon photographs are taken full length. May be the subject will pose as a dame of the First Empire, with skimpy satin gown, elaborate coiffure, jeweled girdle, fan, and vinaigrette. Perhaps she stands half turned about, with her back to the spectator, and her pure profile deftly brought out on a dark velvet curtain. All women would not look charming in such a position. The artist knows whom to choose, and the subject will wonder at her own beauty when she sees the picture.

A willful coquettish girl is posed as a modern Priscilla. The quaint spinning wheel and high backed chair, the small paned window at the back of the colonial room, form a charming contrast with her rich brocade gown and beaming face. The scant puffed sleeves set off the rounded arms, the curve of the wrist, the hand that grasps the wheel is like a rare old painting, and the undulating outlines of the figure are suggested, not revealed, by the prim folds of the flowered silk frock.

These latter day photographs are like paintings, and are likely never to grow old fashioned. They have the charm that distinguishes the portrait painters of the old English school; a charm that custom will not stale. They will not become out of date and grotesque, like the photographs of twenty years ago, found in family albums. In those days a woman was hired to put the lights in the eyes, color the cheeks, and paint the ribbon bows and artificial flowers of the ladies and the gay neckties and buttonhole bouquets of the gentlemen. The new photographs, be it a hundred years hence, always will be things of beauty, no matter what evolutions, contractions, or diminutions may befall woman's dress.—N. Y. Sun.

The Railroad Kidney.

This complaint is now recognized by medical men. It is caused by an artificial stoppage of the pores of the skin, the dirt of the railroads being responsible for such stoppage. If any person will examine his hand after riding for two or three hours in a train—and this is especially true if he be perspiring—he will find his hand is dirty. But a closer examination will show the existence of a fine grime, the particles of which, so soon as the perspiration ceases, act as minute corks, stopping up the orifices of the pores. How deeply this grime works into the skin is shown by the fact that after a railroad trip one washes one's hands and face two or three times before they become clean. It is this grime which produces railroad kidney. Of course it is not to be supposed that an ordinarily healthy person will contract this disease in any trip of a day or two. But where a person is already a sufferer from chronic disease of the kidneys, it is possible that a week on railroad trains would aggravate his malady to an appreciable extent.

Deep Sea Thermometers.

Thermometers made for taking the temperature in moderately deep waters have the tube incased in a copper cylinder, to protect it from inquisitive fishes and from contact with rocks; there is a ring at the bottom to which sufficient weights may be attached to sink it readily. The cylinder has a long, narrow door in front of the scale, which may be opened for the reading; and this door closes with joints so tight that the cylinder brings up the water from the bottom with its temperature practically unchanged by the waters through which it passes.

The Depths of Coal Mines.

M. Grousset's proposal to sink a shaft 1,500 m. in depth has attracted general attention to the depths of existing mines. Some American technical journals claim that there is a copper mine in Michigan with a shaft 1,972 m. in depth. M. Haton de la Goupilliere, director of the Paris School of Mines, has been interviewed on the subject by a correspondent of La Nature, to whom he gave some interesting details. From the data in his possession he found the greatest depths of mine shafts did not exceed 1,200 m. Beyond that it was only a question of bore holes. M. L. Poussigue, director of the Ronchamp Mines, in the Haute Saone, has made inquiries as to what were the greatest depths attained in Europe. In Bohemia, at Pibram, he found the Marie shaft with a depth of 1,130 m., the Adalbert shaft with the same depth, and the Franz Joseph with exactly 1,000 m. The Sainte-Henriette shafts at Flenu, near Mons, Belgium, are said to hold the record, with a depth of 1,200 m. Between 1,000 m. and 1,200 m. the temperature of the rock was 45 degrees; thanks to good ventilation, the atmosphere of the pit at that depth was successfully lowered to 20 degrees, although even at that temperature continuous work was trying.

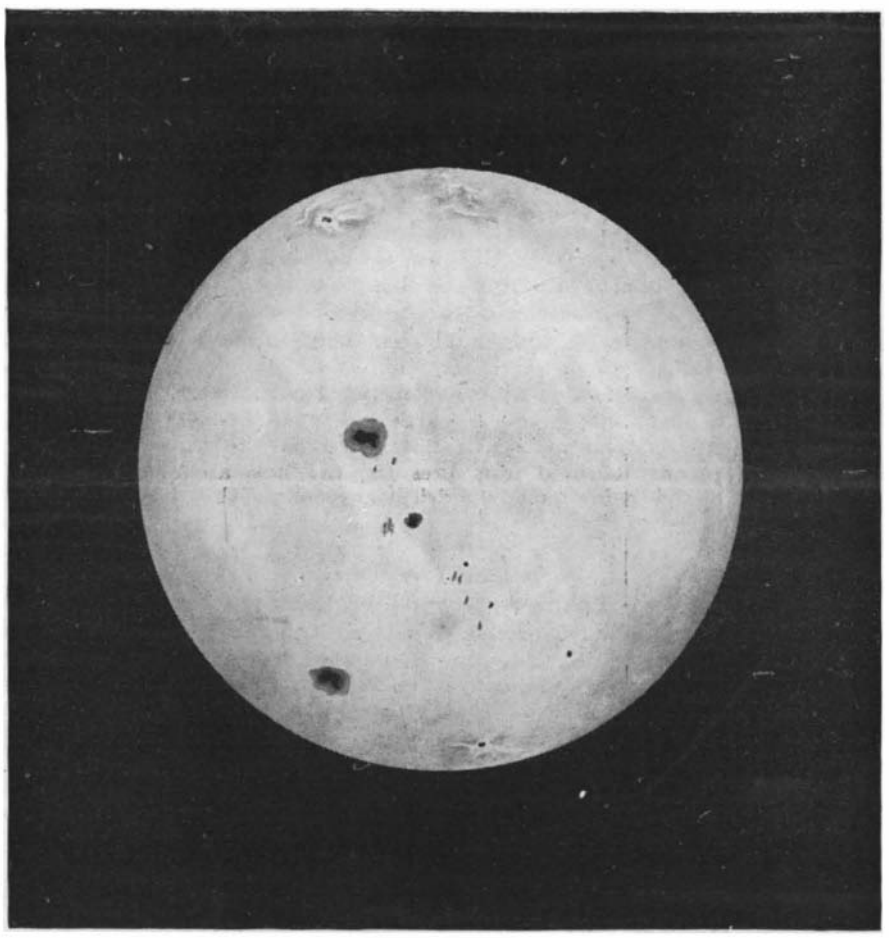
A DRAWING OF SUN SPOTS.

To the Editor of the SCIENTIFIC AMERICAN:

I take the liberty of sending you a drawing of the sun as observed by me, May 19, 5 P. M., with a 3 inch instrument, power one hundred. The two large spots are fine specimens of typical sun spot phenomena, while the faculæ about the developing spots at the edge of the disk seem to afford good examples of the first stages of sun spot development.

L. H. HORNER.

Springfield, Mass., May 20, 1895.



SUN SPOTS.

Telegraphing Without Wires.

Professor A. E. Dolbear, in the Electrical Engineer, says: The increasing interest in the attempts to telegraph without wires both here and abroad makes it worth while to make mention of some facts which have been forgotten or ignored, and I venture to point out that the method which has lately been employed so successfully in England for telegraphing across a sheet of water between three and four miles wide with no connecting cable was fully described by Professor John Trowbridge, of Harvard University, in 1880. He made his original researches between the Observatory in Cambridge and the city of Boston, between which is a time signal wire having the circuit broken by clock once a second. He found he could hear the clock beats a mile away from the line by connecting a telephone to a wire five or six hundred feet long and grounding their ends parallel with the circuit.

His experiments and conclusions are detailed in a paper given before the American Academy of Arts and Sciences and are published in their Proceedings for 1880. How completely he covered this ground of doing telegraphic work by means of earth conduction will be seen by the following quotations from those Proceedings:

"The theoretical possibility of telegraphing across large bodies of water is evident from this survey which I have undertaken.

"Theoretically, however, it is possible to telegraph across the Atlantic Ocean without a cable. Powerful dynamo-electric machines could be placed at some point in Nova Scotia, having one end of their circuit grounded near them and the other end grounded in Florida, the conducting wire consisting of a wire of great conductivity and being carefully insulated from the earth except at the two grounds. By exploring the coast of France, two points on two surfaces not at the same potential could be found, and by means of a telephone of low resistance the Morse signals sent from Nova Scotia to Florida would be heard in France."

This is precisely what is being done in England, carrying out Trowbridge's method. In the various descriptions of methods and operations which I have seen there is no mention of the work of Trowbridge, and whatever merit and utility there may be in this method of doing telegraph work belongs to him. Shortly after the publication of the paper from which I have quoted, Dr. Edward Everett Hale wrote a short story for the Atlantic Monthly in which these earth sheet currents played an important part. Beyond that I have never seen mention of the discovery, for it was a discovery, and an important one too, that slight currents could be detected at relatively great distances from their source by means of a telephone connected to the ground.

The Meccan Pilgrims.*

The Mohammedan pilgrimage to Mecca is a unique custom in the religious history of the world. Notwithstanding the inroads of civilization upon the Orient, 100,000 human beings still undergo the greatest privations in order to kiss the famous black stone which forms part of the sharp angle of the Meccan temple. The benefits of the pilgrimage are great, for the sins of every pilgrim, no matter how dark they may have been, are forgiven by the Almighty, and the supplications of the pilgrim on behalf of others are accepted by God. Such was the teaching of the Prophet.

As soon as the pilgrim reaches the last stage near the sacred city he makes two prostrations in prayer, and divests himself of his worldly raiment. Then he assumes the pilgrim's sacred robe, and sets his heart on Mecca.

The sacred garment called the Ihram consists of two seamless wrappers; one is wrapped round the waist and the other is thrown loosely over the shoulders. The pilgrim's head is left uncovered. After he has assumed the pilgrim's garb he must not anoint his head, or shave any part of his body, or pare his nails. Having entered upon the pilgrimage, he faces Mecca with the devout intention of making the journey to the sacred shrine. Lifting his hands heavenward he cries: "O God, I purpose making this pilgrimage. May the service be easy to me. Accept it from me!" Then, as he proceeds on his journey, he sings the sacred pilgrim song known as the Talbya, which begins with the pilgrim's cry, "Labbaika!" It runs thus:

I stand up for Thy service, O God, I stand up!
I stand up! There is no partner with Thee! I stand up!
Verily Thine is the praise! The blessing! And the Kingdom!
There is no partner with Thee, O my God!

When he reaches Mecca he bathes himself and then proceeds to the temple and kisses the black stone. He then encompasses the temple seven times; three times at a quick step or run, four times at a slow pace. And each time as he passes around he touches the corner of the temple and kisses the black stone. Being spiritually refreshed, he runs to the top of the little Mount Safa, and, on reaching the summit of the mount, he turns toward the temple at a distance and cries: "Surely God hath aided his servant the Prophet and hath put to flight the armies of the infidel with His own power!" He then runs from the top of Safa to the summit of the Mount Marwah, and this he does seven times. It is an exercise which tries the energy of even the youthful pilgrim, while the white haired pilgrim puffs and blows beneath the excessive weight of his religious devotions.

Upon the seventh day of the pilgrimage the crowd of pilgrims assemble in the great mosque, and at 2 o'clock in the afternoon listen to an Arabic sermon which sets forth the excellences of the "Hajj," as the pilgrimage is called.

On the following day he visits the little valley of Mina, or the "wished for" valley, which Adam longed for when he was turned out of Eden. The next day, after morning prayer, the pilgrim ascends Mount Arafat, or the "Mount of Recognition," about twelve miles from Mecca. It was in this place that our first parents, Adam and Eve, forfeited heaven, and were deprived of their primeval purity for eating wheat. The temptation over, the serpent escaped to Ispahan, the devil to Seistan, and Adam to Ceylon. Mother Evé remained at Arafat, but after wandering many years Adam found his wife on this "Mountain of Mercy," and hence it became known as "Arafat," or the "Mount of Recognition."

The next day is the tenth and is known as the "Day of Sacrifice," and as such is celebrated throughout the whole Mohammedan world. The historian Gibbon wrote of Islam as a religion without a priest and without a sacrifice, a strange error for so accurate a writer. Throughout the whole world this day of sacrifice is observed, and especially at Mecca.

Rising early in the morning, the pilgrim says his prayers and then casts stones at three pillars known as the three devils, the first of which is the "great devil." Holding the pebble between the thumb and fourth finger of the right hand, he throws it at a distance of not less than fifteen feet and cries, "This I do in hatred of the devil." It is said this ceremony was performed by Father Abraham.

Having stoned the devil, the pilgrim then proceeds to perform the sacrifice. The victim may be a sheep, or a goat, or a cow, or a camel, according to the means of the pilgrim. Placing its head toward the sacred stone, its forelegs being bandaged together, the pilgrim stands on the right side of his victim and plunges the knife into its throat with great force and cries with a loud voice: "Allahu akbar"—"God is most great! Accept of this sacrifice, O God!"

The ceremony of sacrifice concludes the Meccan pilgrimage, and the pilgrim then gets himself shaved and his nails pared, and the pilgrim robe is removed. The three days following are well earned days of rest. They are known as the "days of drying up of the blood of the sacrifice." Before he leaves Mecca the devout pilgrim should once more kiss the black stone and throw stones at the devil. He should also drink a cup of water from the Zamzam well, the very well from which Hagar drank when she ran away from home with her son Ishmael.

The pilgrimage to Mecca is known as the "Hajj" and the pilgrim as a Haaji. A visit to Mecca at any other time is called the Umrah. If a Moslem possesses the means of performing the pilgrimage once in his lifetime and omits to do so, it is a mortal sin, and he places himself beyond the possibility of redemption. This doubtless accounts for the popularity of the undertaking.

"He who makes a pilgrimage for God's sake shall return as pure from sin as the day on which he was born. Verily the pilgrimage doth put away poverty and sin just as the fire of a forge removes dross. The reward of pilgrimage is Paradise." Such are the words of the Prophet of Arabia.

The first account in English of the visit of a European to Mecca is that of Lodovico Bartema, an Italian gentleman, who made the pilgrimage in 1503. Only five Englishmen are known to have witnessed the ceremony at Mecca: Joseph Pitts, of Exeter, in 1678; Burckhardt, the Oriental traveler, in 1814; Richard Burton, of the Bombay army, in 1853; Dr. Bicknell, in 1862; and Mr. Keane, a petty officer of a steamship, in 1880. The narratives of each of these pilgrims have been published.

The Meccan pilgrimage was a compromise with Arabian idolatry, and no Moslem writer has ever yet attempted to give a spiritual explanation of its ceremonies. It is one of the most curious circumstances in the history of religion that the superstitious and silly custom of the Meccan pilgrimage should be grafted on to a religion which is monotheistic in its principles and iconoclastic in its practices. The spectacle of the Moslem world bowing in the direction of a black stone while it worships the one true God stamps the religion of the Prophet of Arabia as one of compromise.

*Thomas P. Hughes in the New York Sun.

Fifty Thousand Truants.

The Board of Education of New York City has received a summary of the school census recently taken by the police. According to this report there are 168,020 male and 171,736 female school children in this city. The table shows there are 50,069 truants, which means an expenditure of between $5,000,000 and $6,000,000 for new schools before these delinquents can be taken care of. There is now $6,500,000 available for the erection of new school buildings and it is estimated that twenty-five of them will be required.