Correspondence.

Snakes Within Snakes.

To the Editor of the Scientific American:

The following is respectfully contributed to the columns of the SCIENTIFIC AMERICAN, if thought worthy:

Ernest Welch and A. J. Johnson, two young men of veracity, were burning logs for us a few days ago near a stock water pond. On turning an old log from its bed there was seen what appeared to be our common vertically striped water snake, the individual being 3½ feet long and of full habit. Instantly one of the boys cut her in two with an ax. Now they noticed a number of young snakes, some of them cut in twain by the ax, issuing from the sections at the point of severance. Their curiosity being aroused, they took from the carcass, killed, adjusted, and counted forty-five young snakes, 9 inches long. They speedily drifted as investigators into the opinion that snakes were viviparous. They called me to the spot. I took the snakes on a board to the village doctor, where the opinion was rendered that they were undoubtedly oviparous. The doctor said that they had sprung from eggs hatched outside the body, and may have been taken in for purposes of warmth, mechanical protection, or alimentation. But it seems that they would soon smother in the stomach. Then the question arises: Is the snake in some of its varieties a marsupial? Has it a ventilated pouch? R. M. RAGAN.

Fillmore, Ind., August 30, 1892.

An Earthquake in Bermuda.

To the Editor of the Scientific American:

A curious phenomenon occurred here on Aug. 23, at about 10 minutes to 5 A. M. A solution of it would be most interesting, especially as every one seems to have a different theory.

I will begin by describing Bermuda's geographical position, formation, etc., well known to every scientific man.

Bermuda is of coral formation, about 22 miles in length and varying in breadth from 3 miles to 1 mile; very low, the greatest height above sea level being not more than 200 feet. Our nearest point of land is Cape Hatteras, distant about 650 miles. We are nearly opposite Charleston, S. C., and about 770 miles southeast of New York. We are supposed to belong to a range of submarine volcanic mountains, extending from South America to Europe, of which we represent the only peak (or portion of peak, sufficient for the coral insect to build on) above water. The soundings around us show some of the greatest depths of the ocean, somewhere about 5 miles. We are also *very* cavernous, in some parts to such an extent that cuttings in roads frequently have to be filled in every few feet with hard substances, etc.

There is evidence of there once being a severe earthquake here, about, I should say, 1400 (as near as one can come by dates corroborating the testimony of discoverers later on, about Columbus' time), nearly half of the island having subsided in a very remarkable way. Every now and then traces of cedar stumps (the native wood) and other well known roots of our island are dredged up by the large steam dredges used at H. M. dockyard, and layers of soil in which these stumps, etc., were embedded proving beyond all doubt the foregoing statement.

Earthquake shocks have been felt here pretty often, averaging about four or five within the last ten years. I have felt three or four myself, of a very gentle, undulatory type, with little rumbling.

Having stated these brief outlines, I will now describe the occurrence in a few words.

At the time above mentioned (10 minutes to 5 A. M.), about sunrise, a great many people were awakened and pretty well scared and jolted by a heavy explosion, described differently by different persons, followed by a severe vibrating of houses and contents, and then could be heard the distant rumblings, by some, as the shock (?) passed away. By the majority of people three distinct reports or explosions were heard. To me it seemed like a heavy blast under the house.

A remarkable feature was its almost local character, the center of the island, a space of about 8 or 10 miles (right across), feeling it most keenly.

We are connected with Halifax, N. S., by cable, but no news has been received of any volcanic eruption or earthquake anywhere in our vicinity.

The disturbance seemed to be immediately under us, and in one place was sufficiently heavy to crack a chimney.

Various conjectures are of course afloat, but the two only reasonable ones seem to be that it was either an earthquake or a meteoric stone falling in the vicinity in the sea. But several people were out of doors at the time, and although not quite full light, were not sensible of any glare, etc., which one would naturally suppose to follow that of an aerolite, and the size must have been enormous, in fact, unprecedented. Some imagined at the time that one of our large powder magazines had exploded.

One gentleman, who has experienced various kinds of shocks in the West Indies, declares it to be an earthquake of a severe type, *i. e.*, vertical (all shocks felt here before have been undulatory).

Can you help us in any way? About a week before this event we had a severe gale from the southeast.

We have plenty of evidence as to the rocking of the earth and several as to that of the sea in the harbor. I would ask, are earthquakes ever accompanied, preceded or followed by a noise similar to an explosion?

A. C. C. JONES.

Colonial Post Office, Hamilton, Bermuda, August 30, 1892.

American Potash.

This was formerly an article, says Mr. J. U. Lloyd, of much importance, and was exported from the country in large amounts. The New England States were at first the principal producers of potash, Boston, where it is now of no consequence, once being the great export market. With the destruction of the forests the source of supply receded from the East, progressing into the West, where, until a comparatively recent period, more or less was manufactured, but at present only a few stray casks drift into the hands of wholesale druggists or commission merchants. However, contrary to general opinion, the manufacture of potash is still carried on in some parts of the Northwest on a considerable scale. In the neighborhood of the forest of northern Michigan, and in portions of the provinces of Canada, this substance is still systematically manufactured the year through. By "potash" is meant a substance containing 80 to 95 per cent of carbonate and hydrate of potash, the balance being made up of sulphate of potash, chlorides of sodium and potassium, and insoluble matter. About 70 per cent KOH is the standard which it is possible to obtain, but Mr. Lloyd found the average of many casks of first sorts came out at 58·4 per cent, and dealers would not guarantee more than 60 per cent, as they had not control of the "salting" which is practiced by makers. However, a strong protest improved matters during the last twelve months. A total of 504,138 lb. averaged 73·5 per cent KOH, three car loads averaging over 75 per cent KOH, while one car load averaged over 80 per cent. This is evidence that a standard of 70 per cent KOH is attainable. For generations it has been customary to add more or less salt to the contents of the potash kettle just before it is "melted down," and sometimes lime is also added. This not only increases the yield and helps to make it cake, but it improves its appearance. Good potash is generally opaque, of a dull gray, slate or bluish color, often streaked with red or greenish stains. It deliquesces on exposure to the air, and becomes slowly pasty. It is mostly (unless much lime is present) soluble in water. Sometimes it presents a whitish appearance in the center of the cake, and occasionally is honeycombed. This description will generally average 70 per cent and upward KOH. That which is largely mixed with salt is usually crystalline, often nearly white, pearly, and translucent, or of a beautiful delicate pink, and seems to be the most highly valued by those who judge only from appearances.

A Church-going Horse.

Dr. T. B. Redding, of Newcastle, Ind., writing to *Science*, says:

Can a horse reason, or does he act solely from instinct? Many believe that he has reason and intelligence; others attribute all his acts to instinct.

I have a horse, now nineteen years old, that I have owned thirteen years. Soon after I commenced using him, I noticed that on Sundays, whenever I drove him down town, he strongly insisted, by pulling on the lines, on going to the church where I had been in the habit of attending. I watched this disposition constantly after that, and on every Sunday since, when driven out, he has continued to do the same thing, and if left to his own will invariably goes to the church and stops. I thought it possible that he was guided by the ringing of the church bells, and tested him by driving him down town at all hours of the day, before and after the ringing of the bells; but the result was the same. He invariably insisted on going to church on that day, no matter how often I drove him down town.

In going to my office he never offers to go to the church except on Sunday, but on that day he invariably begins to turn south to the street leading to the church, from fifty to a hundred feet before reaching the crossing, and, if not checked, turns into the street and hurries to the church. He has kept this up for at least twelve years. He never does this on any other day than Sunday. In bad weather or in good weather it is the same.

He knows the meaning of many words, such as office, post office, school house, mill, farm, cemetery, church, apple, corn, grass, water, and many others. The fact that he knows the meaning of these words, or at least attaches a meaning to them, I have tested many times in many ways. When his corn is about used up, if I speak of it to him and say, "Deck, your corn is out; you must go to the mill," even before starting from home, he turns in at the mill as I go by, and goes up to the office door, where I have been in the habit of ordering his food.

He also knows a number of people by name and where they reside; and if told to stop at the residence of one of them, naming him, he will do so, without any guiding.

These are only a few of the many evidences of his intelligence. Hundreds of examples might be given showing his knowledge and intelligence, and that he gives very close attention to and understands what is said to him.

Do not these facts strongly indicate that the horse has more than mere instinct, that he reasons; that out of the storehouse of his knowledge and experience he forms conclusions, thoughts, purposes, and plans? He understands certain symbols, such as words; he keeps the run of time and knows uniformly when Sunday comes, for he has not made a mistake in this respect for more than twelve years past; he uses many and diverse means for making his wants known.

Instinct is supposed to imply inherited knowledge of objects and relations in respect to which it is exercised, and will usually, if not always, operate where there is no experience to guide. But this horse's knowledge, in these respects, has not been inherited, but is acquired.

Does the fact of his observing Sunday imply a moral sense? Why does he seek to go to the church on that day? It has been said that animals do reasonable things without having the gift of reason; that they do things involving distant foresight without having any knowledge of the future; that they work for that which is to be without seeing or feeling anything beyond what is; that they enjoy, but do not understand; that reason works upon and through them, but is not in them. The facts that I have related and observed make me greatly doubt many of these statements. I find it hard to sharply define the limits between instinct and reason. The facts that I have related indicate reason, intelligence, motives, and the formulation of plans, methods, and schemes for carrying out preconceived purposes. Some of the acts, at least, indicate pure reason based upon former and remembered sensations, perceptions, and knowledge, and the purpose to gratify merely mental desires.

What motives does this horse have for going to church every Sunday, even at a sacrifice sometimes? It is not for rest, it is not shelter, it is not feed, it is not company, it is not to gratify any merely physical want, for all these things he has elsewhere every day. It is not purely an intellectual or moral want that he seeks to gratify? He stands near the church door, hears much of the exercises, especially the singing, and will remain, almost without motion, whether tied or not, till the services are over, and I am ready to go home. But it cannot be for the mere speaking and singing that he hears there, for he often hears speaking, singing, concerts, the Salvation Army, and music of various kinds while he stands tied at the office on the public square; but none of these take the place of his church going.

The Alphabet in Writing and Printing.

The proportionate use of letters, as given in "Brewer's "Dictionary of Phrase and Fable," is as follows:

E	1,000	H	540	F	236	V	120
T	770	R	528	W	190	K	88
A	728	D	392	Y	184	J	55
I	704	L	360	P	168	Q	50
S	680	U	296	G	168	X	46
O	672	C	280	B	158	Z	22
N	670	M	272				

Consonants, 5,977; vowels, 3,400.

The proportion for initial letters is as follows:

S	1,194	M	439	W	272	J	69
C	937	F	388	G	266	Q	58
P	804	I	377	U	228	K	47
A	574	E	340	O	206	Y	23
T	571	H	308	V	172	Z	18
D	505	L	298	N	153	X	4
B	463	R	291				

For the New York City Cable Roads.

A visit a few days ago to the extensive iron works of the Walker Manufacturing Company, Cleveland, afforded a sight, says the *Street Railway Review*, which has never before been seen. More than 165 car loads of finished work, for the New York cable roads, is piled up in great stacks, to such an extent as to occupy all the available room even in these great shops. Imagine a line of completed work over 300 feet long, 25 feet wide, and in places 30 feet high, stowed away as compactly as possible, and including sections of immense 40 rope drive wheels, differential rims, pillow blocks weighing several tons each, shafting in 30 foot sections and 16 inches diameter, shaft couplers, bed frames large enough to furnish a foundation for a good sized house, sheaves, and a great variety of other parts. It is the largest amount of cable machinery ever massed in one factory at one time, and is a most interesting sight. The nicety of finish and the accuracy of adjustment are wonderful.

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