Correspondence.

"Indian Holes" on Lake George.

To the Editor of the Scientific American:

While camping on Lake George last summer, my attention was directed to the "Indian holes," as they are called, near the foot of the lake. They were pointed out by an old resident, and owing to the obscurity of their location, must be rarely seen by tourists. The visitor to that beautiful region may find them on a small rocky projection in a bay, about a mile south of "Rogers' Slide," on the western shore, in Hague, N. Y. My curiosity to see them was aroused by being told that there the Indians had been accustomed to grind their corn.

These aboriginal mills, if such they may be called, consist of about a dozen well defined "pot holes" in a solid ledge of gneiss, and are grouped together in an area of a few square yards.

The majority of these have a circular opening and the greatest diameter at the center. One, a well 2 feet in width and 3 feet deep, is cut as neatly in the rock as if bored by artificial means. This and several others were filled with stagnant water, which was frequented by swarms of mosquitoes in their several stages of development and other larval congeners. The largest which I observed was nearly 4 feet across, and probably 5 or 6 feet in depth, although I was not able to determine this accurately, as it was filled with earth. Many of the old inhabitants would doubtless still affirm that these were the work of the Indian.

It is very evident that the configuration of the surface was essentially different, when these curious pits were formed, from what it is at the present time. Long and persistently must a powerful torrent have rolled over these ledges to have kept the stones in motion, which slowly drilled their way into the hard rock, and produced the results which we see to-day. Up to a comparatively recent date they may have been filled with soil and detritus. The red man then found them, and excavated such as were suited to his purpose, removing also the stones which had been instrumental in the work. Here was mortar and pestle for him ready made. None of these grinding stones were seen, yet it is likelythat some of them are still there.

It is not *known*, of course, if the Indian ever used these stone mortars for domestic purposes, but it is highly probable that he should have done so, for here was a favorite hunting ground, and doubtless the best of fishing, certainly the best which the lake now affords.

Here, making temporary encampments at certain seasons, he might prepare a supply of ground corn, or else, while passing to and from Champlain, he would merely turn his canoe in hither to pulverize a few handfuls of maize. Mingling this with the limpid waters of the Horicon, he would soon have bread enough baking over his fire, with which to satisfy his appetite for bass and venison.

F. H. HERRICK.

Rock Pt., Burlington, Vt., Feb. 12, 1883.

Flying.

To the Editor of the Scientific American:

I see it stated in your article on flying that the albatross is the largest flying bird. In the year 1858 I was in Nebraska, on the Missouri River, at a place called St. Helena, about two miles below the mouth of the Little James River, and one hundred miles east of Fort Randall. There I ate a piece of a wild turkey, shot by an Indian, that weighed, feathers and all, thirty and a quarter pounds. The flapping of his wings broke off quite large branches of the cotton wood trees, through which he was flying at the time he was shot. How, then, can it be said in view of this fact, for fact it is, that the albatross is the largest flying bird? It seems to me that weight, not bulk, is meant in your article.

The bird has the same relative advantage with his wings in the air as the man has with his legs on the ground, has he not? Hitch a rope to five such birds standing on their legs to pull against a man weighing one hundred and fifty pounds —would not the man be equal to their united strength? If so, how then have the birds greater muscular power than the man, even though the birds use both wings and feet, saying nothing about one albatross being equal in muscular strength to one man?

As sure as the world, I think I could pull more than five thirty and a quarter pound turkeys. It seems to me that the muscular strength of man is not concentrated enough nor located in the right place to enable him to fly, not that he has not the strength.

SAMUEL R. GOODSELL.

Brooklyn, N. Y., Feb., 1883.

Horn and its Uses.

Under the general name of horn may be included (chemically considered) a great variety of tough, somewhat flexible, semitransparent organs intended by nature for defense or covering; of this kind are the hollow horns of the ox, goat, ram, and some other animals, the hoof, the horny claw and nail, and the horny scale of certain insects and animals, chiefly cold blooded, such as the shell (so called) of the tortoise. All these resemble each other very closely in chemical character, and differ considerably from some of the harder and bony defences of some animals, such as the stag's horn, ivory, and the hard tusks of the sea cow, and many others.

Horn (used in the above general sense) has various degrees of hardness, but is always in some degree tough and flexible, even in the cold, so that, however dried, it cannot be bruised to powder as bone can. It is also distinguished from bone very remarkably, in being softened very completely by heat, either naked or through the medium of water, so as then to be readily bent, moulded, and made to adhere by pressure to other pieces of horn in the same state. No such change takes place with bone.

The valuable experiments of Mr. Hatchett, with those of preceding chemists, have also shown a most decided chemical difference between horn and bone. When bone is boiled with water in an open vessel, a large quantity of gelatine is extracted, and the insoluble residue consists of the earth of bone, together with albuminous cartilage, so that the texture remains unbroken. On the other hand, the different species of horn boiled with water, even for many days, give to it but very little gelatine, the softer and more flexible horns giving the most. The horn itself during the digestion is softened considerably by the hot water, but on being taken out and dried, it becomes more brittle than at first, and in proportion to the loss of gelatine. Bone therefore contains much gelatine, and horn scarcely any.

Another difference appears after the utmost action of fire on each. When bone is burnt, a number of substances are procured, and the last residue is an earthy salt, chiefly phosphate of lime, amounting on an average to from half to one-third of the entire weight of the bone. When horn is treated in the same way, the volatile products are indeed the same, or nearly so, but instead of a large earthy residue, scarcely any earth or any other combustible matter remains. Bone therefore contains much phosphate of lime, but horn hardly any.

But the substance which they possess in common is that condensed tough matter, insoluble in water and weak acids, which Mr. Hatchett has so satisfactorily shown to resemble albumen in all essential properties, and which in bone forms the original organic cartilage on which the earth is deposited during the growth of the animal, and in horn forms almost the whole substance.

Horn seems to consist in by far the largest proportion of condensed albumen, combined however with a small and varying portion of gelatine, which modifies its texture and flexibility, and also with a small portion of phosphate of lime.

It has been mentioned that boiling water in open vessels had hardly any action on horn, but when confined in a digester, horn as well as bone is totally soluble, because water assisted by the strong heat of a digester will dissolve condensed albumen as well as gelatine. This method therefore is not sufficiently distinctive for chemical analysis.

The fixed alkalies readily and totally dissolve horn into a yellow saponaceous liquor.

The products obtainable from horn and bone of all kinds by distillation *per se*, were early attended to by chemists, as it is from these substances that a variety of valuable ammoniacal salts and preparations are obtained.

The products from bone and horn by fire are very similar, and it is only the soft parts, such as gelatine and albumen, that are decomposed in the process, the earthy phosphate remaining inert without adding to or modifying the volatile products. These latter are a weak ammoniacal phlegm or water, on the first impression of the fire, to which succeeds an oil, thin and limpid at first, but afterward brown and foul, and at last of a pitchy color and consistence, and an extremely fetid and empyreumatic smell. During the whole of the distillation, carbonate of ammonia comes over, partly dissolved in all the liquid products and partly concreting on the sides of the receiver in crystalline plates. A second distillation with regulated heat is used to procure the ammonia purer; but it can hardly ever be totally freed by this means from the volatile oil; so that, though limpid and gratefully ammoniacal, the alkaline liquor or salt thus obtained always retains somewhat of the peculiar smell of the oil, as must be observed by every one who compares the scent of common spirit of hartshorn with that of the pure carbonate of ammonia or sal volatile, which is prepared in a different way and from other materials.

But horn (properly speaking) is seldom employed for the purpose of distillation, being too valuable as an article of manufacture to be thus sacrificed. The only horn ever used is the stag's horn or hart's horn, which, as above mentioned, partakes much more of the nature of bone, is not flexible like ox and other horn; when in shavings, readily dissolves by boiling water into a pure nutritious jelly, entangling the phosphate of lime along with it, which makes it slightly opaque. Stag's horn, therefore, is somewhat intermediate between bone and true horn.

Horn and tortoise shell being applied to a number of mechanical purposes, must be cut, bent, and shaped in an infinite variety of ways. This is done in most instances by the assistance of heat applied either dry or by softening the horn in boiling water, and sometimes with the assistance of a weak alkaline liquor. When thus softened, one part may be made to adhere to another by mere pressure as firmly as the undivided substance. Thus, for example, to make the horn ring that surrounds a common opera-glass, a flat piece of horn is cut out of the requisite shape, the ends intended to join are thinned down by a file, the piece is then put into boiling water till sufficiently supple, and is then rolled round a warm iron cylinder, and held in that position by a vice, so that the ends envelop each other. Another piece of iron heated and grooved is then laid upon the seam of the jointed ends, and pressed upon the cylinder, and confined there by iron wire; and the heat of the two partially melts that portion of the horn, and cements the ends so completely that no seam or joining can be observed when cold.

In a similar manner two pieces of tortoise shell may be joined together by first neatly shaping with a file the parts that are to be united, then tying a thick paper doubled in several folds over the joining, and pressing the whole together with a hot iron instrument like curling irons, heated just sufficiently that the shell when warmed by it will begin to bend by its own weight. When cold the joining is perfect, and without seam. Too great heat would make the shell rise in opaque blisters, and spoil its beauty.

Horn is made to imitate tortoise shell in the following manner: Make a paste with two parts of quicklime, one of litharge, and a little soap-maker's lye, or solution of caustic potash; apply it skillfully on a thin plate of horn in a way that will best imitate the natural spots of the tortoise shell, leaving the light parts untouched; let this paste dry on, then brush it off, and the horn will be permanently stained. The effect is much improved by laying beneath it, when used, a piece of brass leaf. This staining may be varied at pleasure by substituting other colored substances for the litharge.

The tips of horns are used for knife handles, buttons, and other purposes. Horn for knife and whip handles is sawed into blanks, heated, pared, and partially shaped; then heated in water and pressed between dies. It is afterward scraped, buffed, and polished. Deer horns are worked like bone or ivory.—*Glassware Reporter.*

Falsification of Brandy.

A lamentable picture has been drawn in a recent report of the American Consul at Rochelle of the falsification of brandy, which, it appears, in the last three years has undergone a complete transformation, and is no longer brandy, the greater portion being prepared from alcohol of grain, potatoes, or beet. The most unsatisfactory circumstance is that even the merchants who desire to purchase a pure cognac cannot be certain that they do so, for the proprietors of the vineyards, all of whom are distillers, have become so clever in the manipulation of alcohols and the accompanying drugs that they deliberately make a brandy of any required year or quality. The mention of the years 1849 or 1876, for instance, in an invoice or on a label, means simply that the article is presumed to have the taste or color of the brandies of those years. The increasing importation of German potato and beet alcohols into the Charente ports is an additional proof that the less brandy that is consumed, the better for the health and intellect of the consumer.

It is, moreover, becoming a custom to sell the brandy in 12 bottle cases, marked with one, two, or three stars according to the presumed quality, thus avoiding any compromising mention of year or place of production. Some of the manufacturers import the small raisins from the East and make what they call brandy from the juice, there being at least one such establishment in operation at Cognac. Apart from the unsatisfactory purchase of a brandy which is not a brandy, drinkers should seriously consider what are the properties of the liquid which they are so complacently imbibing. It is simply an active poison, the imported alcohol, which is known to the trade as "*trois-six*," being of 90° strength, and sold at a little less than three francs a gallon. Its characteristic effect is to produce an intoxication in which the patient is especially inclined to rage and physical violence, while insanity, of an obstinate and almost hopeless form, is the inevitable consequence of a prolonged use of it. It is said that the great increase of violent and brutish crimes in France may be traced to the drinking of this brandy and absinthe. The slang term for a glass of cognac is *un petrole*, and for coffee with cognac, *un grand deuil*. Not only in France, but in other countries, and even in the United States, these liquors are producing a condition of national alcoholism of the worst kind, far beyond the ordinary drunkenness arising from unadulterated intoxicating drinks.

Ancient Mode of Baking Walls.

Among the recent discoveries at Hissarlik by Dr. Schliemann are the remains of buildings which he supposes to have been temples. The walls are respectively 1·45 meters and 1·25 meters thick. Nothing, he says, could better prove the great antiquity of the buildings than the fact that they were built of unbaked bricks, and that the walls had been baked *in situ* by huge masses of wood piled up on both sides of each wall and kindled simultaneously. Each of the buildings has a vast vestibulum, and each of the front faces of the lateral walls is provided with six vertical quadrangular beams, which stood on well polished bases, the lower part of which were preserved, though, of course, in a calcined state. Dr. Schliemann maintains that in these ancient Trojan temples we may see that the *antæ* or *parastades*, which in later Hellenic temples fulfilled only a technical purpose, served as an important element of construction, for they were intended to protect the wall-ends and to render them capable of supporting the ponderous weight of the superincumbent crossbeams and the terrace. Similar primitive *antæ* were found in two other edifices, and at the lateral walls of the northwestern gate. It was also discovered that the great wall of the ancient Acropolis had been built of unbaked bricks, and had been baked like the temple walls *in situ*. According to Dr. Schliemann, a similar process of baking entire walls has never yet been discovered, and the *antæ* in the Hellenic temples are nothing else than reminiscences of the wooden *antæ* of old, which were of important constructive use.