ply suitable sizes and quality. They are taught to sew in the best manner with rapidity; are taught the various stitches known to the artist in needlework; are taught to make every variety of children's garments under the outer, every variety of undergarments for ladies and gentlemen; all branches of dressmaking, cutting, and fitting with facility, all branches of needlework in tailoring; are taught the art of making and ornamenting table and bed linen, fancy work of endless variety, including fine lace work and embroidery. The exhibition of work was remarkably neat and tasteful, some of it being exquisite in design. The effect of the work upon the pupils is said to be excellent in every way.

Correspondence.

The Bell Telephone.—The Decision of Judge Lowell.

To the Editor of the Scientific American:

In a number of your late issues you have had some interesting articles on Judge Lowell's late decision in the Bell telephone suit against certain parties for alleged infringement. I have read the opinion of the court in the above case (published in SCIENTIFIC AMERICAN of August 27.) with much care, and desire to say a few words upon the same, as I view said opinion as not justified before an intelligent host of American inventors, thinkers, and writers. To be granted too much by such decisions brings our patent system into disrepute, as affording monopolies the power to control entire fields of useful invention. By careful examination of the field in dispute I realize that the desire of the Bell monopoly is to gain, by decisions of courts, the only right to use electricity to convey intelligence by vocal sounds. There is no fight over apparatus, no fight over the means employed to vary the current; the monopoly simply asks to have the current set aside for their use, whether said current is *undulated*, *vibrated*, *intermitted*, *pulsated*, or *disturbed*.

Now let us quote the most astounding part of said decision: "But Bell discovered a new art, that of transmitting speech by electricity, and has a right to hold the broadest claims for it which can be permitted in any case." It is a fact well known that many others in the same line of experiment, before Bell's patent of 1876, were in sight and in *hearing* of the desired result. They were all using a current, and were trying different plans of using said current, and had succeeded in a partial manner by *disturbing* a current of electricity. Mr. Bell found a more effective way of using the same current. Just as well give McCormick the only *right* to cut grass and grain because he did it better than any who worked before him.

By all means give Mr. Bell his every due—give him credit for being a persistent worker, and give him all he has invented; but it seems very inconsistent to confer on him the only right to use a vibrated or undulated current. Look at the facts: Reiss, Gray, Dolbear, and others, *prior* to Bell's patent of 1876, were working hard and strenuously with this old, *disturbed*, *varied*, and *vibrated* current, getting groans, music, and words out of it, and now all the hosts of electricians of our country are to see another step in and take away their old current.

What I desire is that each inventor shall fully be entitled to use what he invents and brings forward, and no more.

As the Bell telephone stands to day it looks as if it is next to impossible to obviate the permanent magnet, the induction coil, and current, but if some inventor can find a means of using electricity and its established powers in the transmission of vocal sounds, *in a manner and by apparatus not patented by any one else*, that an enlightened public sentiment and a high and honorable court of last resort should protect all alike. How will Mr. Reiss over in the old country, and in our own land of rights and liberty how will Elisha Gray, feel when that little current, so subtle, so uncontrollable, had finally been taken from him? How will my old friend Dolbear feel, too, after *varying* the current, away back yonder, years ago? In fact, what will be the wonder and surprise of the hundreds of intelligent professors who have in years and years been using intermittent currents and getting sounds and songs, when they learn that they are forbidden to undulate a current in any endeavors to make a machine which will talk at the other end of the line?

I hope to hear others speak out and give their views on this subject.

GRAVITY.

Fire from Milk Pans.

To the Editor of the Scientific American:

The house of Mr. Henry Goulding, of Dover, Mass., caught fire a few days since in a very original way. It was one of those days when the sun was "shining in his strength," that one of the family observed smoke issuing from the clapboards on the sunny side of the house, and on examination it was found that a hole several inches long had been burned entirely through the clapboards and inner boarding of the house (together at least 1½ inches thick), and a few minutes would have sufficed to render the destruction of the house certain, with the limited means at hand for extinguishing a fire.

A bucket or two of water served to remove all present danger, and on searching for the cause it was found in a pile of bright tinned milk pans, a few feet distant, one or more of which were so placed as to concentrate the rays of the sun upon a few square inches of space on the surface of the clapboarding of the side of the house.

We are all familiar with the story of Archimedes burning the ships of the enemy by reflecting the rays of the sun upon them; nevertheless there would have been another unaccountable fire but for the timely discovery of this freak of nature, or rather chance.

STEPHEN MOORE.

Newton, Mass., August, 1881.

Temperature Observations in the Comstock Mines.

Recent temperature observations at Virginia City, Nevada, show the heat of the Foreman shaft to increase with the depth as follows:

Depth.	Temperature.
100 feet.	50½ degrees.
200 "	55 "
300 "	62 "
400 "	60 "
500 "	68 "
600 "	71½ "
700 "	74¾ "
800 "	76½ "
900 "	78 "
1,000 "	81½ "
1,100 "	84 "
1,200 "	89¼ "
1,300 "	91½ "
1,400 "	96½ "
1,500 "	101 "
1,600 "	103 "
1,700 "	104½ "
1,800 "	105½ "
1,900 "	106 "
2,000 "	111 "
2,100 "	119½ "

The temperatures were ascertained by drilling at the successive levels holes not less than three feet deep into the rock, and inserting a Negretti and Zambra slow-acting thermometer (of the pattern adopted by the Underground Temperature Committee of British Association, and standarized at Kent) into the hole, closing the hole with clay, and leaving the thermometer for twelve hours—not less than three holes being tried at each point.

Commenting upon these results the Virginia City *Enterprise* calls attention to the circumstance that though there is on the whole a steady increase of temperature as depth is attained, the increase of temperature is not regular. For instance, the rock at the 400 is two degrees cooler than at the 300 level; between the 400 and the 500 levels there is a difference of eight degrees; while in other places an additional depth of 100 feet shows but a slight increase in the temperature. Thus at the 1,800 level the temperature is 105½ degrees, while at the 1,900 it is but 106 degrees, an increase of but one-half a degree. This difference is undoubtedly owing to the character of the rock at the points where the holes were made; therefore it would be of great interest to have, in connection with the temperature, a description of the rock; not only the kind of rock, but also the nature of the same, whether carrying much lime, gypsum, or iron pyrites. It would probably be shown that where there was much lime there would be an increase of heat not warranted by the increased depth, and the reverse where lime was absent.

A Peculiar Property of Gutta Percha.

It is a well-known fact that when gutta percha is placed in water having a temperature of 60° to 70° C., it becomes very plastic, and may be used to receive very delicate impressions. Not so well known, however, is the information that the softened gutta percha becomes very elastic toward severe shocks, that it will bear blows from large hammers, and allow itself to be thrown against a strong wall without showing any indication of the result, while at the same time it is so susceptible to gentle pressure that it is capable of receiving the slightest of impressions.

This peculiar property is possessed by other plastic bodies, though in a less degree, as, for instance, freshly kneaded bread. It is considered as resulting in consequence of the occluded air contained in the substance.

The following simple experiment demonstrates the correctness of the above suggestion: Two spheres of equal weight are made of gutta percha which has been softened in water at 70° between the palms of the hand. One of these is placed on a card, and the air removed from the sphere by exhausting it under the receiver of an air pump; the other is retained for comparison. Both spheres, from their weight, will assume the form of round cakes, but the one under the air pump will swell considerably and exhibit a wrinkled surface. The increase in volume often more than doubles its original size. If the swollen piece is permitted to harden under the receiver of the air pump and then broken with a chisel, its cross section will appear honeycombed like the interior of a loaf of bread, while the fracture of the other piece will only show small cavities. Very dense gutta percha does not swell under the air pump, but if placed under mineral oil and made empty a voluminous evolution of air from the gutta percha will take place.

After the air is again admitted under the receiver it will be found on examining the gutta percha that it has lost the property of hardening on cooling. It has become like tough greasy leather. A voluminous evolution of air was also observed when clay, putty, and kneaded bread were examined under oil in vacuo similar to the above-described treatment of gutta percha.

The same phenomenon was observed when a sample of gutta percha, which had been softened in an air bath, was treated as above; in this case a longer time is required for the heating, as the heated air is very slow in giving the amount of required heat.

With some bodies the inclosed air plays an important part in affecting its mechanical properties; thus, clay, for instance, may be somewhat compressed by means of a piston in a cylinder, but as soon as the pressure ceases it resumes its former volume.

The densest of clay when placed under the air pump will become covered with numerous fine crevices (small as a hair), which close when the vacuum is sufficiently reduced.—*F. Kick, Dingler's Polytechnis. Che. Journal*, 240, 363.

Danger in the Westward Traffic in Calves.

The recently appointed Treasury Cattle Commission, sitting in Chicago, have just issued the following circular, addressed especially to the Governors of the States and Territories west of the Alleghanies:

The Treasury Cattle Commission, appointed by the Secretary of the Treasury in pursuance of an act of the last Congress, deem it their duty to call your attention to the imminence of the danger to which herds in the States and Territories west of the Alleghanies are exposed from the traffic in dairy calves, which is becoming a very common one between these States, now happily exempt from the contagious pleuropneumonia of cattle. That a very large proportion of our country has up to this time remained exempt from the dangerous malady, is owing chiefly to the fact that the current of our cattle traffic has hitherto been mainly from the West toward the seaboard. But the business of purchasing calves from the Eastern dairy districts, and scattering them throughout the Western States and Territories, which has within a year or two past assumed such mammoth proportions, has augmented the danger to which the uninfected districts are exposed tenfold; and if it is permitted to go on unchecked, the danger of a general infection of the great cattle growing and grazing regions is imminent. We therefore call upon you to use whatever influence you may legitimately bring to bear upon the people of your State to discountenance and discourage a traffic that is fraught with such danger to their material interests. The district known to be infected with the scourge embraces pretty much the whole of the country bordering on the coast from New York city southward to Washington, and extending to a greater or less distance inland. But the Commission would recommend that, until a more thorough examination can be made, and a complete isolation of infected herds be secured, every possible means that can be legitimately resorted to should be brought to bear to discourage and prohibit traffic in cattle from anywhere near the infected regions.

An Illuminated Buoy.

For some weeks the Pintsch Lighting Company has maintained a lighted buoy off Sandy Hook. The buoy is hollow, five feet in diameter at the water line, and is filled with compressed gas, enough, it is said, to supply for thirty-five days a light which is visible six or seven miles. The "Pintsch" gas used is made from fat, paraffine refuse, shale oil, grease, or any similar substance. It is compressed in retorts, and is carried out to the buoy when needed. The owners assert that this gas is far safer than coal gas, is one-third cheaper, and can be compressed in a far smaller space than coal gas. A patent regulator, devised to insure a steady flame whether the pressure in the buoy is high or not, consists of a cast iron conical vessel, about twelve inches in diameter and six inches high, the upper part of which is closed by a gas-tight membrane, to the center of which is fastened a rod with a movable joint, and this again is connected with a lever attached to a special valve, which opens to a greater or less extent according to the pressure on the membrane, and the light remains clear and steady notwithstanding the tossing caused by heavy seas. A device for lighting the gas of such a buoy by electricity was patented by the company; but the cost of the gas is so small that it was deemed best to use as little machinery as possible, and this device was given up. The refilling of the buoy at certain intervals is done by a tender. Gas from the tender's tank at a pressure of ten atmospheres is allowed to fill the buoy to a pressure of six atmospheres by means of a rubber tube. The buoy is built without rivets, the body forming a compact wrought iron vessel.

The company claim that such buoys have been tried satisfactorily in England, Russia, and Germany, the cost of the light being only ten or twelve cents a day.

The electric buoy that was put at Sandy Hook last summer drifted away and was picked up at sea by a Dutch vessel and carried to Antwerp.

A Fish Hawk's Nest in a Channel Buoy.

The iron spindles which work the reefs in Long Island Sound are made with globular heads or basket shaped tops so as to be clearly seen. The spindle that warns vessels of the location of the end of Groton Long Point Reef, near Watch Hill, has a top shaped like a grocer's bushel basket. Some years ago a pair of fish hawks carried cornstalks and straw enough to this spindle to nearly fill the basket, and adopted it as their home. The same birds, apparently, have continued to occupy the spot, and the female has just hatched out a new brood. It is seen circling about the nest at the approach of nearly every vessel. The winter storms usually shatter the nest, but the birds repair the damage every spring.