NATIONAL TELEPHONE ASSOCIATION.

The fourth convention of the National Telephone Association of the United States met at the Hotel Vendome, Boston, Sept. 5. The attendance was large. The American Bell Telephone Company, of Boston, made every provision for the comfort and entertainment of delegates. Hon. Marshall Jewell, ex-Governor of Connecticut, was chosen president of the association.

At a Nantasket Beach dinner, President Forbes, of the American Bell Company, expressed, in a brief address, the kindly feeling of the parent company toward the various exchanges throughout the country. Gov. Jewell responded for the association, paying handsome and deserved compliments to President Forbes and General Manager Vaile.

Mr. Gardiner G. Hubbard, of the original Bell Telephone Company, and who is the father-in-law of Prof. Graham Bell, the inventor of the telephone, followed in an address, reviewing the history of the development of the telephone. He divided the history of the telephone into epochs. The first was eight years ago, when Professor Bell, rising from a piano where he was seated, declared himself convinced that the sound of the human voice could be carried in tone waves upon electrical wires. Another epoch was later, when one day the professor entered his room and handed him a piece of iron attached to a wire. Placing it to his ear he was amused at hearing articulate sounds. The next was when he stood among others, with the Emperor of Brazil, at the Centennial Exhibition, in Philadelphia. The telephone had been mounted, and was on exhibition. The Emperor, placing the instrument to his ear, started back, exclaiming, "My God, it speaks!" Another epoch was the establishment of the first telephone exchange. Still later and marked periods were when the present management of the American Bell Telephone Company took the control of affairs, and when the Western Union Telegraph Company became identified with its interest.

Out of about 600 exchanges, the whole number of exchanges reporting was only 81, covering about 30,000 telephone subscribers.

Of exchanges having more than 1,000 subscribers, the Metropolitan Telephone and Telegraph Company, of New York City, comes first, with 2,873; the Law Company, of the same city, has 578; Chicago has 2,596; Cincinnati, 2,056; Providence, 1,906; San Francisco, 1,294; Boston, 1,186; Detroit, 1,110; Albany, 1,100; Buffalo, 1,047; Louisville, 1,024; Baltimore, 1,017. The smallest number of subscribers in any exchange reporting is ten.

During the year there has been a general increase in the number of subscribers.

Mr. Babcock, of Evansville, Ind., reported that his exchange had 700 miles of No. 14 wire, and that in building one of the lines, 45 miles long, the lineman got drunk and neglected to put on any insulators, merely tying the wire to the poles. After the wire was up, he could see no difference between its working and that of others that were insulated, and they had built some of their other lines also without insulators, and they had worked well. The exchange now has 400 miles of lines which have been working for a year without insulators. He was not an electrician himself, but those who claimed to be electricians had told him that, although the lines might work in dry weather, he would be unable to do anything with them in wet weather; he had not, however, found that this prediction had come true. On an 81-mile line he has often whispered over it of an evening, and the whisper has been heard distinctly at the other end, although on twenty miles of it there are no insulators. The exchange has two 40-mile lines running parallel, the one insulated and the other not, and no one can tell by the working which one he is on.

DAIRY INTERESTS OF ITALY.

In our issue for June 10, 1882, a valuable description of Italian cheeses and the processes of their manufacture was reprinted from the *Journal of the Society of Arts*.

We have since learned that the information given by the *Journal* was drawn entirely from a report on the Dairy Interests of Italy, by Thos. C. T. Crain, U. S. Consul at Milan, to whom all the credit should be given. Mr. Crain's report was printed in the issue of "Commercial Reports" (Department of State, Washington), for August, 1881. In addition to the matter quoted, Mr. Crain gives a considerable amount of information with regard to other dairy interests in Italy, dairy associations, cheese factories, and so on.

The account of butter making is quite interesting. Families having little milk use cylindrical churns, in which the cream is shaken by movement of the churn handle. Factories use large cylindrical churns on trestles, in which are wings turned by machinery. In Pavia, round boxes called "puraggie" are used. Each box has a spoon fastened to an axle which is turned with a crank by two men. Some use a cradle churn, which saves labor and produces equally good butter. In Cremona, an American machine is in general use. It is a horizontally fastened tub, in the interior of which is a reel similar to that used in silk-making. The dairyman of Parma beats the milk with a cream-whipper, and skillfully lets the floating cream, which gathers in the bucket, overflow into a fine edged wooden bowl, and thence into the churn. The temperature of the cream is always kept from 10 degrees to 15 degrees Reaumur (55 degrees to 65 degrees Fahr.).

In churning two men alternately beat the cream with a butter beater joined to a straining frame, raising and covering it by leverage. Butter should begin to form in three-quarters of an hour. When it is necessary to hasten formation, water is added; where advisable to retard it, ice. If made before the time mentioned, the butter is soft; if after, hard and set. When prepared it is taken from the churn, worked with the hands, formed into blocks, and left to drain. The skimmed milk is used for the *ricotta* cheese. In Cantanzaro butter is made with the old fashioned churn. The butter is kept by inclosing in small bladders in which it can be conveniently kept and carried about without danger of change.

At Modica, where the butter is delicious, it is not made directly from the cream but from the "ricotta," which is obtained by boiling the "small" milk after extracting the caseine. The butter maker of Sardinia puts the "ricotta" in a bowl of cold water, and shakes and presses it with his fingers. In half an hour a white scum appears on the surface of the water; and by continued movement and pressure of the "ricotta" the scum increases during the succeeding half hour. This scum is the butter of the *ricotta*.

Mr. Crain finds that dairy associations and the factory system of cheese making have existed since remote times in Savoy, the French Jura, and on the Alpine slopes.

Where land is owned in small plats, as in the mountainous parts of Upper Italy, large dairies are impossible, and cheese making can be carried on only by the factory system. During the past eight or ten years, under the fostering influence of the government, these cheese factories have greatly increased in number and improved in management. They are found everywhere except in Sicily, where a curious custom prevails.

The small producers carry their milk to the large producers; and after their deliveries have amounted to 250 or 350 quarts, they receive that quantity back again at one time. This system of reciprocal loans is said to work well and be beneficial to all, as a large quantity of milk worked at once makes more cheese than the same amount of milk worked in small quantities at different times.

Damp Houses and How to Remedy Them.

Damp houses are a fruitful source of discomfort and disease, and yet, as important as their influence is, it is amazing how seldom means are taken by which the evil may be prevented. When a house is said to be "well drained," however true this may be of the plans adopted for carrying away the refuse water of domestic operations, it very rarely means that the site has been drained to prevent damp.

When experienced medical men see house after house built on foundations of deep retentive clay, inefficiently drained, they foretell the certain appearance among the inhabitants of catarrh, rheumatism, scrofula, and a host of other diseases of a similar nature. Where a damp house exists in connection with deficient sewerage, drainage or a cesspool full of decomposing material—an unfortunate conjunction too often met with in country and suburban houses—other and more dangerous diseases, as typhus fever, are induced. The watery mist of fog rising from a damp soil affords an admirable vehicle for the subtle and deadly exhalation of the decomposing drainage matter, by which they are too certainly conveyed to the interior of the house. And, physiologically dependent upon this condition of affairs, a mental as well as a physical depression is induced, which drives those subjected to the temporary relief afforded by the use of ardent spirits and other stimulants. Thus, in this, as well as in other departments of sanitation, the connection between physical and moral disease is easily traced. There can be no doubt as to the increased pecuniary and sanitary value of land suitable for building sites, arising from efficient drainage being carried out. The greater the inducements offered by the healthy condition of a neighborhood, the greater the value of the land for building sites. An excess of moisture in any district inevitably influences the local climate both as regards dryness and temperature.

The most effectual preventive of damp houses is the complete drainage of the site on which they stand. All other remedies are but remedies in name, more especially when the soil is very damp; in such a case lead or slate placed round the bottom courses of the foundation with water-proof cement may prove efficient for the time, but will ultimately become inoperative. The system of drainage for carrying off surplus water from the land is different from that adopted for conveying away domestic refuse water, etc. In the latter it is essential, nay, imperative, that the drains should be water-tight, capable of conveying the water admitted to their interior immediately to its ultimate destination, but incapable of passing any of it to the surrounding soil through which the drains are laid. The former, on the contrary, should be permeable throughout their length; that is, have apertures of sufficient width throughout which the water of the surrounding soil can find its way into the interior of the drain, which should be of such a shape as to facilitate the removal of the water to its destination, preventing its return to the soil.

In laying and forming the drains the following points should be attended to: The first to be observed is the uniformity of slope or level of the bottom of the trenches. The method of accomplishing the perfectly uniform slope of the drains, from their highest point to their outfall, is by the use of level-rods or the spirit-level. Not so with the level-rods, as following description of their uses will show: Three rods are required, two of them two feet long and the third as much more than two feet long as the drain is deep—that is, if the drain is three feet six inches deep, the rod must be five feet six inches long. The rods are strips of wood with cross pieces nine inches long on the upper end. The two shorter rods are planted upright, one on the ground on a level with the field at the head of the drain, and the other at the lower end, and a person stands at one of them looking over its top, with his eye on a line with the other. A second man then takes the longest rod and holds it upright in the drain, just touching the bottom, and walks along from one end of the drain to the other, keeping it in an upright position. If, while it is moving along, its top always appears on a line with the tops of the other two—as seen by the person looking along the three—the fall of the drain is uniform; but if it rises above this line at any one place, the bottom is too high there, and requires to be reduced; if it falls below the line the bottom is too low, and must be raised. In this way the fall may be rendered perfectly uniform. In cutting drains the best way is to commence with the main drain, and at its lowest point, working gradually up to the highest. An intelligent mason or carpenter may be intrusted to make drains of this sort at very little cost, and we are sure no houseowner who cares for the health of his family will ever regret the investment. —*Builder and Woodworker*.

Coal in Colorado.

The Denver (Col.) *Journal of Commerce* reports the existence in Gunnison County, until recently known as the Ute Indian Reservation, of a bed of coal thirty feet thick, covering in one place sixteen hundred acres.

It is situated on a small stream tributary to the Uncompahgre River, about eight miles northwest from the Las Pinas Indian agency, and one hundred and seventy-six miles southwest from the city of Denver. The coal crops out along the mountain side about eighty feet above the plain; where exposed it shows a thickness of thirty feet of solid coal. The *Journal* says that the coal is semibituminous and of a jet black color, and adds:

"It has been analyzed by Professor Wuth, of the city of Pittsburg, Pa., and pronounced by him to be of an excellent quality. It is almost entirely void of sulphur, and will smelt iron without coking. It has been used by the miners in that vicinity for the purpose of dressing their steel drills, and pronounced by them to be superior to charcoal for that purpose. There is no doubt, taking into consideration the thickness of this vein and the extent of the deposit, that it is the largest vein of coal yet christened on this continent. It was discovered about two years ago, when the Indians held possession, by some prospectors, who associated themselves together so as to hold it until such time as the Indians should be removed, and the land thrown open for entry and location, which has now been done."

Chimney Draught.

At the closing meeting of the British Association Lord Rayleigh read a paper before the Mechanical Section on the effect of wind on the draught of chimneys, based upon experiments made with tubes and a fan driven by hydraulic power. He stated that a horizontal wind would usually promote a draught, except in cases where the chimney opened out upon a large expanse of wall, and so was indirectly affected. The cure in this case was to carry the chimney higher. When the wind was inclined downward to the chimney at an angle of thirty degrees and upward, there was a down-draught, and the *maximum* up-draught was produced by wind inclined upward at about the same angle. The simplest thing to prevent wind blowing down a chimney was to erect a T-piece on the top. In that case a vertical or inclined wind favored the draught, and the effect of a wind blowing through the T tube was practically nothing. Mr. Park Harrison suggested as the only real remedy an increase of draught. A member contended that chimneys should be turned upside down, the opening at the fireplace being narrow and the outlet widened. If all the chimneys in a house could be made to open into a common cloaca, a down-draught would hardly ever occur.

Suture of Tendon.

Dr. Yeats recently presented a case to the Manchester Medical Society (*British Medical Journal*) where he had, six weeks after an accident, united with four catgut sutures the divided ends of the tendon of the extensor communis digitorum of the middle finger, at the metacarpo phalangeal joint. The skin wound was united by silver sutures. The operation was done antiseptically. The wound healed in four days; and three weeks afterward the patient had perfect control over his fingers, flexion and extension being perfect. At the end of five months the fingers were as strong and useful as before the operation.

Lake Constance.

The shrinkage of Lake Constance, in Switzerland, owing to the extraordinary dryness of the past winter, has brought to light many interesting relics. Among them there are bone and flint implements, harpoons, pottery, many specimens of which are intact, clubs, baskets, arrows, field tools, and animal remains. Among the latter are skeletons of the bear, the bison, and the moor-hen. The discovery also includes a considerable quantity of oats and wheat in a good state of preservation, and a remarkably perfect and artistically executed stag horn harpoon. The relics have all been removed to Frauenfeld, and added to the collection of the local historical and natural history society, which is now the richest in lacustrine objects in the Helvetic Confederation.