The little Griscom motor and the Cleveland motor are of course present, driving sewing-machines and fans. Edison contributes also some small motors of excellent finish. Amongst larger machines there is one by Daft and one by Elihu Thomson. But by far the most important of all exhibits of this class is that of Mr. F. J. Sprague, which shows a very great advance on anything hitherto accomplished. Mr. Sprague appears to have succeeded in producing a motor which runs at a uniform speed whatever its load. It is employed in driving a small loom.

In telephones there is not much new. The Clay Telephone Company exhibits its system, with a remarkably simple and efficient receiving instrument. Beyond this there is absolutely nothing new. The chief interest centres on the historic exhibitions of Elisha Gray, Graham Bell, A. E. Dolbear, and Van der Weyde. The remarkable telephones of Daniel Drawbaugh are not yet exhibited to public gaze on account of pending legal proceedings.

In telegraphy the sole novelty is the marvellous multiplex telegraph of Delaney, based upon the principle of La Cour's "phonic wheel," and capable of transmitting seventy separate messages simultaneously through a single wire.

Passing on to other exhibits, it should be mentioned how Messrs. J. W. Queen and Co. display a very large collection of imported apparatus, including the finest instruments of Elliott Brothers, Carpentier, Breguet, Hartmann, and Edelmann. Some excellent measuring-instruments by the Electric Apparatus Company of Troy, N.Y., are also shown. A collection of a curious and instructive nature was exhibited by the U.S. Patent Office, consisting of the historic models sent by inventors. Here may be seen the original Edison telephone, the original Brush dynamo, the original Edison lamp, and many other similar objects, including many old forms of electric motor dating from the years 1840-50. A special effort has also been made to get together a complete modern library of books bearing on the science of electricity. Some six thousand volumes have in this manner been procured, and form a valuable collection.

The Franklin Institute of Philadelphia, which has organised this Exhibition, must be congratulated on the energy and enterprise which it has put forth. It would be impossible to get together a collection of apparatus more thoroughly representative of the solid progress made in electro-technics on the American continent. Though the Exhibition is yet far from complete, it has become much more so since its opening on September 2. It will remain open until October 11.

A NEW APPLICATION OF INDIA-RUBBER[1]

IF iron takes the lead among articles of modern industry in the extent and number of its applications, it yet falls short of india-rubber in their variety. This latter article, indeed, promises soon to attain a universal diffusion. Its industrial career, though little more than just begun, already outstrips that of most substances that were first in the field.

The mere enumeration of its qualities would suffice to account for the diversity of its applications. It possesses so great an elasticity that by this quality alone it adapts itself to a thousand different uses—brace-bands, garters, sides of boots, &c.

Observe how, if not the lightest, india-rubber is at least the most powerful reservoir of mechanical energy known. It lends itself most readily to the restitution, under the form of mechanical labour, of the energy imparted to it by tension, and this restitution may be effected with remarkable quickness. It is owing to the relative lightness of india-rubber considered as an accumulator of energy, and, above all, to its power, that the exactness of the principle of "heavier than air" may be demonstrated on a small scale.

From an electrical point of view, india rubber acts as a better insulator than gutta-percha, and is, indeed, one of the best insulating bodies known. At the same time that its specific inductive capacity is weaker than that of gutta-percha, it does not become plastic at a moderate temperature. These properties render it an excellent insulator in electrical applications: submarine and subterranean telegraphy, electric light, transmission of force, &c. While it insulates better than gutta-percha, the conductor, where india-rubber is used, does not run the risk of being put out of centre, as is the case sometimes with gutta-percha.

India-rubber is known to oxidise under exposure to air and light; above all, under alternations of dryness and damp. By subjecting it, however, to a special operation, called vulcanisation, a product is obtained which main-

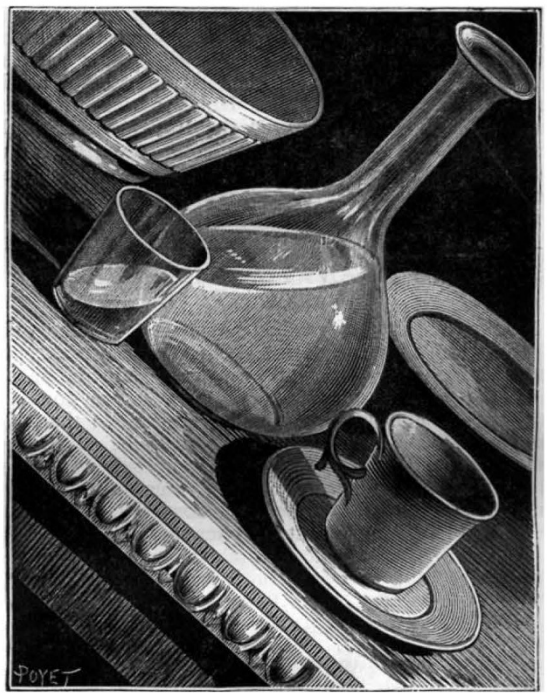

FIG. 1.—Position in which household utensils furnished with india-rubber may be placed without falling.

tains its flexibility at low temperatures, resists heat much better, does not oxidise in air, and absorbs less water. It is especially under the form of vulcanised india-rubber that its applications are numerous.

There is, finally, a third form of india-rubber, no less useful, that of ebonite, or hardened india-rubber, a form which combines with its lightness and great electrical resistance, the further advantage of resisting acids, and which is therefore exclusively employed when vessels for the electric pile or other reservoirs of a light and not readily brittle character are wanted. Like a new Proteus, india-rubber is thus seen to adjust itself to the ever more numerous and pressing demands of modern industry.

To turn now to the new, curious, and original application an idea of which it is the object of this notice to convey. The aim of the inventor, whose name unfortunately has not reached us, has been to take advantage of the great mutual adherence of a soft and a hard body. It is by the utilisation of this relation that the inventor has originated quite a series of household objects in earth-

[1] From *La Nature*.

ware, porcelain, glass, &c., which manifest a remarkable adherence to the body supporting them, and this result he has obtained by the very simple expedient of securing to the lower part of all kinds of goblet objects (Fig. 2) a groove, A A, in the form of a swallow-tail, into which is lodged a band of red india-rubber, a variety of vulcanised india-rubber, forming, when deposited, a kind of circular cushion. Objects furnished in this manner are almost incapable of falling from their places. They may be placed on a wooden table, and the table be inclined (Fig. 1) from 45 to 50 or even 60 degrees without upsetting any of them. The most direct and immediate use offered by the properties which a vessel so provided with india-rubber thus acquires is evidently in the shipping service. At the Fisheries Exhibition of last year in London, and at the Health Exhibition of this year, the inventor has displayed a little barque, the bridge of which is entirely covered with dishes, plates, &c., all furnished in the manner described, and the barque, floating in a basin, may be

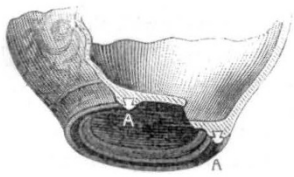

FIG. 2.—Arrangement of the india-rubber covering in a swallow-tail groove A A, provided at the base of the object.

tossed to and fro in every direction without displacing a single piece.

All who have been on long voyages at sea know the disagreeable and painful impression produced by the screen of cord laid along the table to prevent the glasses and bottles from falling.

As an accessory advantage possessed by the undisplaceable india-rubber dishes may be reckoned the less noise they occasion, and the less risk of breaking they run on being clapped down carelessly or hastily on the table. Washhand basins and water-pots may likewise be advantageously constructed with the india-rubber band.

Invalids in bed, and compelled to eat from a board placed more or less horizontally across the bed, and children, so apt to upset glasses and bottles, will both find their advantage in the undisplaceable contrivance. We have thus a simple, ingenious, and useful application of india-rubber, which we thought it incumbent on us to place before our readers.

NOTES

IN the Daily Weather Report of the Meteorological Office for Friday last, there appears a note of some importance on the temperature of the Gulf Stream. A comparison has been made between returns from 28 ships, containing 116 recent observations, with the data in the charts of the Atlantic sea-surface temperature (recently published by the Office), of the area which lies, roughly speaking, between the latitudes of the North of Ireland and of Bordeaux respectively, and extending half way across the Atlantic. It appears from this comparison that during the past summer the ocean temperature in the course of the Gulf Stream was abnormally high, in June the whole of the above-mentioned area being about 3° above the mean, in July the half of the area nearest to the British Isles being about 1°·5 and in August about 1° higher than the mean. It is to be hoped that similar comparisons will from time to time be given by the Meteorological Office, so that the point may be investigated which was long ago suggested by the late General Sabine, as to there being possibly a connection between the temperature of the tropical and sub-tropical waters of the Atlantic and the weather of Europe which followed, and to which we drew attention some years ago (NATURE, vol. xxi. p. 142).

SIR WILLIAM THOMSON lectured on Monday night, under the auspices of the Franklin Institute, at the Academy of Music, Philadelphia, on the "Wave Theory of Light," to a large audience.

GEN. PITT-RIVERS, as Inspector of Ancient Monuments, has issued a very careful and detailed report on his excavations in the Pen Pits, near Penselwood, Somerset. These pits are on the borders of Wilts, Somerset, and Dorset, and consist of a number of hollows in the surface of the ground of various forms and sizes, without order or regularity in their distribution. They cover a tract of high land of greensand formation, the area thus originally covered having been estimated at 700 acres. Various conjectures have been made by antiquaries as to their use, some maintaining that the pits are the remains of a great British city, or formidable series of fortifications; if so, as Gen. Pitt-Rivers points out, it would upset all our conclusions as to the social and political condition of the Britons, and of the extent of the pre-Roman population of these islands. Last autumn Gen. Pitt-Rivers carried out a series of excavations, cutting a section right across the pits in the parts most likely to yield remains of any possible inhabitants. Not a bit of pottery the size of a pea, he tells us, was found, and no indication whatever that these pits have ever been used as habitations. Ample evidence, however, was found that the pits were used as quarries, from which the inhabitants obtained grind-stones or quern-stones. The remains of quern-stones were found, all bearing marks of having been tool-dressed, and in the villages around many such stones are met with, all of them stated to have been obtained from the pits. It is to be hoped that the very careful piece of work thus performed by Gen. Pitt-Rivers, and his report, will set the question permanently at rest. Several plates of sections, plans, &c., accompany the report.

A COMMISSION of five French medical men have reported on their investigations as to the real nature and action of the cholera poison. The substance of their report as it appears in the *Times* is as follows:—"The initial lesion of cholera takes place in the blood. It essentially consists in the softening of the hæmoglobin, which makes some globules lose first their clear shape, the fixity of their form, and the faculty of being indented. Those globules adhere together, lengthen out—*en olive*—stick together, and in fulminating cases especially some are seen which are quite abnormal, while others appear quite healthy. The entire loss of elasticity of the globule (which is shown by the preservation of the elliptic form when it has been stretched out) is, in our view, a certain sign of the patient's death. To stretch out a globule you have merely to alter the inclination of a plate on which a sanguineous current has been established in the field of the microscope. The fluid column stops at one point, whereas the rest continues to flow. An elongation of the intermediary globules results, and then a rupture of the column. In the gap thus formed are some scattered globules. If these revert to their primitive form, the patient may recover. If they keep the elliptic form, we have seen death follow in every case, even if the patient's symptoms were not serious at the time of the examination of the blood."

EDUCATION in British Burmah appears to be in a sad condition. According to a correspondent of *Allen's India Mail*, the province has not yet produced any student capable of attaining the B.A. degree, and only five or six have succeeded in passing the first examination in Arts. There is no local school of medicine, and such native medicine as exists is a compound of empiricism and a belief in charms and enchantments; while the principal legal authority has repeatedly deplored the gross