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SUBTLE BRAINS

AND LISSOM FINGERS.

BEING SOME OF THE CHISEL-MARKS OF OUR INDUSTRIAL AND SCIENTIFIC [illegible].

And Other Papers.

BY

ANDREW WYNTER, M.D., M.R.C.P. Lond.

AUTHOR OF

"CURIOSITIES OF CIVILIZATION," "OUR SOCIAL BEES," ETC.

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ROBERT HARDWICKE, 192 PICCADILLY.

1869.

TO MY READERS.

THE majority of the papers in this volume have already appeared in the pages of *Once a Week* and the *London Review*. I am half afraid that the public have had enough of them already, and I have only been tempted to republish them by the representations of my Publisher. The fact that "OUR SOCIAL BEES,"—a work somewhat similar in scope to the present volume—has already reached a sixth edition, indicates, he tells me, that I have not yet exhausted the public patience. Trusting this may prove to be the case, I have ventured to trespass once more upon the good-nature of my readers. Professional work will not permit me, however, to do so again; and the next time I take up my pen, it must be in furtherance of the main business of my life—the study of Mental Disease.

A. W.

PARK HOUSE,
ADDISON ROAD, KENSINGTON,
August, 1863.

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THE BURIED ROMAN CITY IN BRITAIN.

We had been traversing the London Road, which leads out of Shrewsbury by its eastern suburb, skirting every now and then the silvery Severn, meandering through a park-like country, when my companion turned the horse's head down a bye-road on the right, which speedily led us amid some undulating pastures. "And now," said he, as the carriage jerked over a ridge in the road; "now—we are in the Roman City."

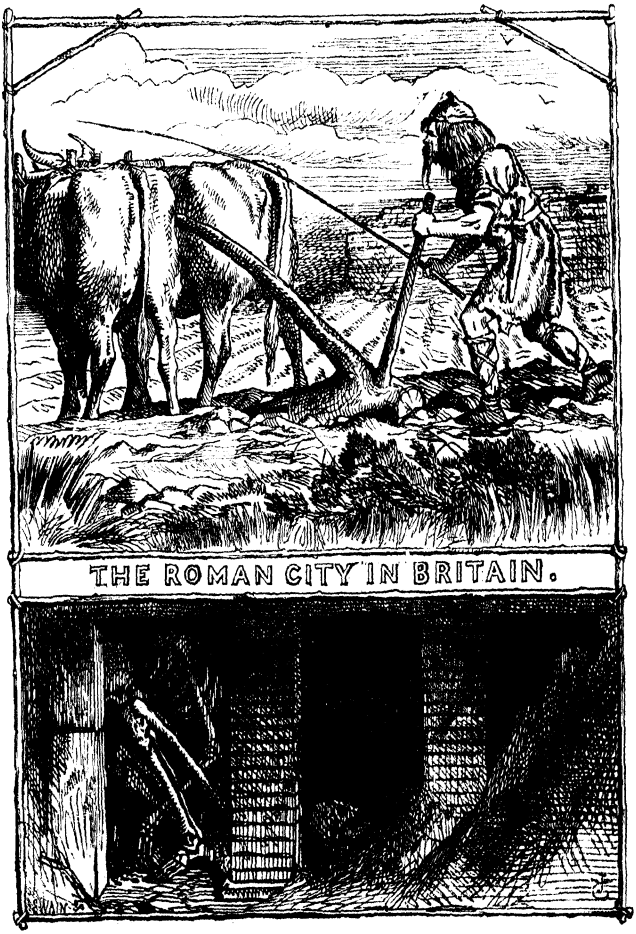
I looked around me. There were undulating fields and crops of turnips, hedge-rows and trees — an English landscape, pure and simple, such as we meet with everywhere in the luxuriant western counties. "But where have the Romans left their marks?" I asked, half incredulously. My companion pointed with his whip to a dark object a little in advance—a weather-beaten wall which rose, a massive and significant ruin, in the midst of the pastoral scenery surrounding us. As we drew near, the Cyclopean mass of grey stones, streaked at intervals with bright red lines of tile-work, left no doubt upon our minds. "And if you will observe narrowly," said my companion, "you will see indications of the line of the walls." And truly an

irregular line, inclosing a somewhat pear-shaped area, could be traced, its long diameter running north and south; the stem of the pear, if we may so term it, dipping down into the waters of the rapid Severn. This ridge of buried town-wall, my companion tells me, makes a circuit of three miles; and as I traced it round about, I could see underneath the emerald sod suggestive outlines, now dipping under the hedge-rows, now crossing the brook, and next upheaving the middle of the field. It was clearly the dead and ruined city, dimly sketched beneath its winding-sheet of common grass. In another minute we were close to the old wall itself, which cropped up suddenly from the edge of a turnip field—a huge bone, as it were, of the buried skeleton beneath. To the south of this wall a square area, about two acres in extent, railed off from the adjoining fields, presented itself, trenched in every direction, and heaped with mounds of rubbish. A crowd of visitors were lounging about, looking down into the deep pits and trenches with a serious, puzzled look.*

"And this?" said I——

"Is where we are exhuming Roman Britain," interrupted my companion.

* Since the above was written the Excavation Committee have very judiciously caused all the earth excavated from the trenches to be collected into a steep mound, which is to be planted with evergreens and surrounded by gravel walks. From this mound a bird's-eye view will be given to the spectator of the whole ruins laid open. The hypocausts, passages, courts, and roads will be beneath him, plainly depicted as in a map. By this means the interest of these singular remains will be greatly enhanced to the visitor.



We alighted and passed into the enclosure. I could just see the head of a labouring man, who was delving away in a long trench. Sitting on the side of the trench was a figure dressed in black, his gaitered legs

disappearing in the pit. Those who remember Landseer's picture of "Suspense" — a Scotch terrier watching at a rat-hole — will be able to appreciate the whole look and attitude of that figure as the pick broke into every fresh lump of earth. Leaving my human terrier for a moment, still watching at his hole, I clambered over the mounds of earth, and looked down at the dead bones of Roman Britain. The old wall above ground had been the starting point from which the excavations were commenced, and it was soon discovered that it was the above-ground portion of a large building in the form of a parallelogram, divided into three compartments; the middle one being 226 feet long and 30 feet wide, the side aisles, if we may so term them, being of exactly the same length, but one only 14 feet wide, and the other 13 feet 9 inches wide at one end and 16 feet at the other. The middle compartment is paved with brick in the herring-bone pattern, but portions of tesselated floors were found at the eastern extremity of the northern lateral chamber. This place is nothing less than a stone puzzle to the archæologists. Apparently, it was not roofed in, as few tiles were found in the area. That it stood in the angle formed by the intersection of two streets is clearly ascertained, and that it was entered from both of them is equally clear. Along its western façade ran the great Roman military highway which connected London with Chester, still in use and known under the Saxon name of Watling Street. That this road expanded into a wide space opposite the main western entrance there can be no doubt, for it has

been traced for some distance, until fresh buildings impinge upon the way, and considerably narrow it.

Along the northern side of this building ran another street joining the Watling Street wall at right angles; wherever excavations have been made in its course the pick has come down upon a surface pitched with large pebbles. The Roman streets, it is clear, were formed like those of Shrewsbury, and scores of others in Britain to this day. What public purpose this building could have served is, however, a matter of the merest conjecture. It has been suggested that it formed the forum, for the reason that it is very similar in form to the remains of the forum found at Pompeii. A curious piece of ironwork, somewhat in the form of a trident, which fitted into a staff, apparently some emblem of office, was found in its principal area.

At present, however, a veil has been drawn over the subject in the shape of a flourishing field of turnips, the Committee of Excavation hitherto having to manipulate their limited plot of ground somewhat as Paddy did his insufficient blanket, by filling up one place in order to expose another. Consequently, the only portion of this debateable building at present open to view is the portion of *old wall* originally above ground. This weather-beaten fragment bears upon its southern face evidence of having been connected with other buildings, for the springings of three brick arches are very plainly visible upon it, and the spade of the excavator has traced out the underground walls that supported them. Here evidently three "barrel roofed" rooms, possibly granaries, existed, as in one of them a

quantity of charred wheat was found. Trenching southward soon proved that they had only opened but a small portion of some great central building of the city, for the spade at some considerable depth struck upon the semicircular end of a wall, and speedily a fine hypocaust, 37 feet long and 25 feet wide, was laid open. The Romans, it may be stated, in this country at least, did not warm their apartments by open fire-places or stoves, but by hot air chambers built underneath the ground-floors, which were supported at short intervals by rows of pillars formed of square tiles placed one upon another. Here, then, was the grand heating apparatus of a very fine room delved out of the earth in almost as perfect a state as when Roman fires circulated through it. The pillars of tiles were in perfect order,* and the soot still adhered to their sides as though the smoke had only passed through them yesterday. In the same line a number of other smaller hypocausts were soon exhumed. Here and there the floors of small apartments paved with the herring-bone pavement are seen, and in one spot the walls of a sweating-room are still lined with the flues used to warm them, consisting of the common pottery tiles with flanged edges, employed by the Romans for roofing to this day. Passages floored with indestructible

* We regret to state, that during a temporary stoppage of the works, several inroads of the barbarians in the shape of "cheap trippers" took place, in which these pillars were wantonly thrown down; they have since been restored to their old position by the careful hand of Dr. Johnson. We are sorry to say, however, that the only bit of the wall-inscription yet found in these ruins, was by these later barbarians entirely destroyed.

concrete lead between these rooms, and in some places the plaster still adheres to the walls, painted either in bands of red and yellow, or arranged in patterns of not inelegant design. In one place the wall is tesselated, an embellishment which is, we believe, quite unique. There is evidence also that the outsides of some of the buildings in Uriconium were plastered and painted, as the semicircular end of the large hypocaust when discovered was so finished. Similar external embellishments were discovered at Pompeii. What we may term the stoke-hole of one of these hypocausts remains still intact. Three steps, formed out of single slabs of stone, sharp almost as the day they came from the stone-dresser's hands, lead to an arched opening of splendid workmanship, which directly communicates with the hot-air chamber. I could almost fancy I saw the Roman stoker shovelling in the wood and coal (for coal has been discovered here) some biting December morning, to keep life in the shivering centurion pacing above. Near this stoke-hole there was found an ash-heap—a Romano-British ash-heap!

Imagine, good reader, Macaulay's New Zealander, after taking his survey of the ruins of St. Paul's from the broken arch of London Bridge, kicking his foot by accident against a London ash-heap, and you will perhaps be able to realize the eagerness of the Shrewsbury archæológists. Here were discovered, as was expected, numberless unconsidered trifles, but of priceless worth, as illustrating the every-day life of the inhabitants. Fragments of pottery, broken by the Roman "cat," or "come to pieces in the hand,"

of the Roman housemaid, of course; hair-pins of bone, that had once fastened back the hair of some fair Lucretia, with the pomade still adhering to them (an analytic chemist could possibly tell us of what oils and scents they were composed); pieces of window-glass, through which, perhaps, the aforesaid beauty had peered at the beaux of Uriconium; the bones of birds and animals, and even the shells of oysters, were found mingled together with bone needles and ornamental fibulæ, coins, &c. These things, especially the small articles of female gear, imply that this portion of the large building at least was devoted in part to female use. When the workmen were clearing out the hypocaust leading from the stoke-hole, crouched up in the north-west corner they discovered the skeleton of an old man, and close to him (the ruling passion strong in death) was found a little heap of coins, and among them fragments of wood and nails, evidently the remains of a small box or coffer, decayed by time, which had once held the old man's treasure. These coins, 132 in number, were all, with two exceptions, of copper, leading to the inference that he was a domestic.

In excavating the ruins of Pompeii, the skeleton of what was supposed to have been the master of the house was discovered near a back wall, with a bag of money near one hand, and a key near the other, implying that he was attempting to escape from the coming destruction by a back-door. A man had no banking account in those days; it was therefore quite natural that, in the moment of escape, he should be found clutching his treasure; but it does seem strange

that, like a fly in amber, his very attitude should be preserved to us.

For centuries the Saxon hind ploughed the fields overhead, and little dreamed of the ghastly *dramatis personæ* that lay grouped beneath his feet.

It is customary when a new building is about to be erected, to deposit on the foundation-stone coins for the current year, of the reigning sovereign, in order to mark the period of its erection. Fate would appear to have led this terrified old man with his little box of the current Roman coins of the country into this hiding-place, to fix the time of the destruction of the city and of the overthrow of the civilization that Roman dominion in this country had left among the half-emasculated Britons. The great majority of these coins bear the effigy of the Constantines, which points to the end of the fourth century as the period of the destruction of this city. Now, if I remember rightly, the Roman Legions finally left the island in the year 426; thus it will be seen how speedily the barbarian Picts followed on their footsteps, and swept away the cities they had founded and left to the charge of the enfeebled Britons.

Close beside the west wall of the hypocaust, where the old man was found, lay the skeleton of a woman, and huddled against the north wall was another. All these skeletons were close together. In the yard adjoining, was found the skeleton of a baby, so young that its teeth were still uncut. A little eastward four or five skeletons, chiefly of females, were found, leading to the inference that the men, through craven

fear, basely deserted the weaker sex in the terrible moment of massacre. What overwhelming terror—what sudden panic must have overcome these inmates, for the mother thus to desert her babe, and for the man to herd with women in such a dismal hiding-place. These tell-tale bones leave to us a vivid picture of that dreadful day—fourteen hundred years ago—when the enemy poured into the city and ravaged it with fire and sword.

Southward of this inhabited and apparently private portion of the great block of buildings, the basements of another series of structures has been found. The lower walls and the herring-bone pavement of a square court opening immediately upon the open space, or *place* of the great military way or Watling Street, have been laid bare. The court is forty feet square, and on its north and south sides runs a row of chambers from ten to twelve feet square.

Dr. Henry Johnson, the Hon. Secretary of the Excavation Committee, with classic instinct, immediately fancied that it was the atrium of a private Roman dwelling, especially as in the centre of the court the pavement was wanting, indicating the possibility of the remains of an impluvium; but, on search being made, no signs of one having been there were found; and further excavation proved that many of the usual features of such a private mansion were wanting. There was no tablinum or peristyle, the side of the atrium or court in that direction being closed by a wall, on the outside of which are a series of recesses, supposed to have been shops. Further on

in the same line eastward is a large paved cistern, filled with tiles and broken pottery; and beyond again a paved space, which had evidently been a bath. This portion of the building, however, has been only partially excavated, but what is now visible has the appearance of having belonged to a public swimming-bath. But what could the open court, surrounded with apartments, and bordering upon the principal street, have been? It is suggested that it might have been a market-place. That it was a building of great resort there can be no doubt; for of its two street entrances the step of the southernmost is worn away to the shape of the human foot several inches deep. By the direction of the footsteps, it is clear that the people flocking thither must have come up the street from the southward. Strange, that, after fourteen hundred years, we should thus have visible evidence of the direction in which the main currents of human life used to flow in this ancient city. There is a much wider entrance to this supposed market-place, or bazaar, a little north of the foot entrance; but this was not approached by steps, but by an inclined plane, formed of three slabs of stone placed side by side. Mr. Thomas Wright, the chief director of the excavations, imagines that this was a carriage, or at least a barrow entrance; and the discovery of a horse-shoe here would seem to justify this hypothesis: but we find no wheel-ruts as they did in frequented carriage entrances at Pompeii; moreover, a herring-bone pavement would scarcely have withstood the wear and tear of carriage traffic. The rooms round the court

have proved the greatest puzzle of any to the archæologists. The walls stand at least three feet high from the pavement, but there is no sign of any door-ways. It has been suggested, that wooden steps, long since perished, may have given entrance to them; but then we should expect to find the marks in the walls where they had been fixed, as was the case at Pompeii, where staircases appear to have been very common.

In excavating the rubbish from these rooms, in some cases to ten feet in depth, stores of different substances were found, one apparently had been a magazine of charcoal, as a large quantity of that substance was found in it. Another contained the bones, horns, &c., of animals, chiefly those of the red deer and the ox, and the tusks of boars. On the antlers of the deer, saw-marks and signs of tools of other kinds are very visible, and some of the bones have been turned in a lathe. These signs seem to indicate that the fabrication of various articles in bone, ivory, and stags' horn, found in every direction amongst the ruins, was carried on here; and that a veritable bazaar for the sale of such trifles existed on this spot we have good reason to believe from the fact that weights of different sizes were dug up close at hand.

Not far from this court a portion of a pillar was found, the bottom of which is engraven with the *phallus*, so often discovered on Roman remains. Possibly the pillar may have formed a portion of a Priapian pillar, or emblem of fruitfulness. If so, its vicinity to the open court may indicate that it served the purpose of a market-place for edibles, as

well as that of a bazaar. Be that as it may, it is clear that this department of the great block of buildings formed its southernmost limit, for a paved street has been discovered close to its walls, along which ran a side gutter, or possibly a water-course, such as we find at Salisbury; for in one place large stones were discovered, placed transversely in the channel, as though they had been used as stepping-stones. This great public building contained possibly a forum, establishment of baths, a market-place, and bazaar, was surrounded on three sides, at least, by streets; and, for aught we know, excavations to the eastward will prove that it formed what the Romans called an *insula*.

The discovery of numerous fragments of columns and capitals within its ruins, proves that it must have been ornamented with architectural features of a striking character, which gave it a noble appearance, situated as it was, in the middle and on the highest spot of the city within the walls. Beyond this building excavations have been made only to a small extent southward, but sufficiently to prove that buildings exist on the other side of the street last discovered. The Committee of Excavations have evidently hit upon the most central and important spot in the city; and, dig where they will,—north, south, east, or west,—in the four acres which the Duke of Cleveland has leased to them, they cannot avoid opening up remains which will probably help to elucidate the stone puzzle they have already exposed.

As I moved away from my minute examination of

the ruins, I found the gentleman in black gathering up the precious fragments rescued from the trench with eager solicitude, which he carried off to a kind of box of Autolycus, under charge of the foreman of the excavators. The labourer was digging away like a machine, and taking as much interest in his work. As he shovelled up some fragments of pottery I remarked:

"There seems to have been a grand smash of crockery hereabouts."

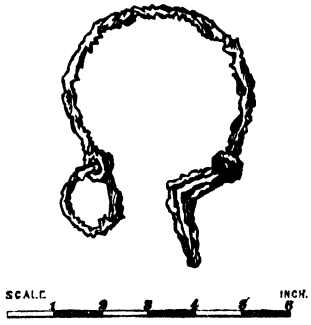
"Yes, sir," he replied; "there be a main sight of them sort of cattle buried here," and went on with his work. Such are the differences between man and man induced by education.



Ornament in bronze, probably belonging to a Steelyard. [*Actual size.*]

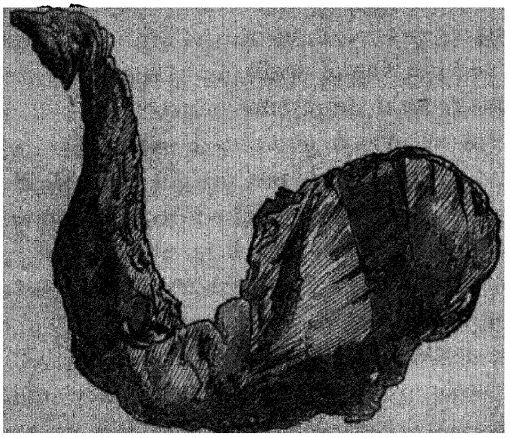
After tracing the dry bones of the Roman city, it was doubly interesting to give it life by means of the relics collected from its depths. A considerable number of articles illustrative of the every-day occupations and amusements of the inhabitants have already been secured in the Museum at Shrewsbury. Pottery, of course, is in abundance, including a piece of Samian ware

repaired with metal rivets, and some not inelegant Romano-Salopian pottery made from fine Broseley clay, innumerable roofing-tiles of pottery and micaceous slate with the nails yet remaining in them. Of iron-work there are abundant remains; keys, chains, shackles, rings, nails, door-hinges, and an iron padlock have been found so wonderfully like uninteresting modern work, that one cannot help thinking the stilted Roman of our school-books must, after all, have been very like one of ourselves. Turning over the box of relics my friend in the black gaiters has directed my attention to—what do I find?—scores of cock's legs with natural spurs, filed evidently to fit on bronze ones. That they knew how to fight a main of cocks at Uriconium is quite evident, and those legs in all probability were those of celebrated victors. Searching again, I found a cock made of lead, evidently *a child's toy,* that had once gladdened little Roman eyes not far from where I stood. Again rummaging, I come upon roundels formed from the bottoms of earthenware vessels, evidently used by the gamins of Uriconium in some game, possibly Hop-scotch, which we know to be a pastime of remote antiquity. And then for the ladies, as Autolycus would say, I found in the Museum combs of bone, bodkins, beads, bracelets; and for the



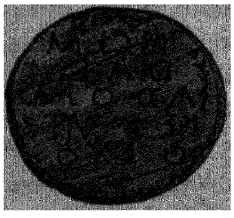
The Shackle.
[*One-fourth of the full size.*]

men, *studs* and *buttons* of bronze, a strigil to scrape his skin in the public sweating-bath, and tweezers to tweak his curled beard. But what is this — a patent



The Leaden (toy) Cock. [*Actual size.*]

medicine in Uriconium? Yes—an eye-salve—here is the seal of the physician who vended it, marked, like Rowland's Macassar, with his name, to prevent "unprincipled imitation," as follows:—



The Physician's Stamp. TIBerii CLaudii Medici DIALIBAnum AD OMNE VITium Oculorum EX Ovo. [*Actual size.*]

"*The dialibanum of Tiberius Claudius, the physician for all complaints of the eyes, to be used with egg.*"

But we may go on for a week turning over the curiosities of Uriconium and come at last to the conclusion that, Romano-Britons as they were, they must have ate, drank, slept, played, and looked won-

derfully like ourselves. Not so, however, if we are to believe newspaper paragraphs—the barbarians who put an end to all this refinement ages ago.

In the corner of an orchard abutting upon the Watling Street road, in the village of Wroxeter, but within the old line of walls, upwards of twenty human skeletons were a short time since exhumed, several of the skulls of which presented extraordinary appearances. Their facial bones are, in fact, all askew, the eye-sockets of one side of the face being in advance of those of the other side. Such terrible-looking creatures as these real original "Angles" were certainly enough to frighten the city into subjection. An examination of these skulls, however, and a knowledge of the conditions under which they were found, would lead to the conviction that Mother Earth has to answer for this distortion. When exhumed, they were in the condition of wet biscuit, in consequence of the state of the ground, which is full of springs. It can easily, therefore, be imagined that the weight of the superincumbent earth acting through so many centuries had pressed those skulls that had fallen sideways thus out of their usual shape. There is in the British Museum a skull of a Saxon warrior, disinterred not long since in Cambridgeshire, with his Saxon ornaments about him, which presents similar distortions with respect to the orbits and the extraordinary elongation of the head which these Wroxeter skulls do. Judging from this fact alone, I am inclined to think that these poor people of the orchard have been shamefully maligned as to their personal appearance.

Close to the spot where these remains were found, the Watling Street road dips down a steep bank towards the Severn, where there is a ford; but in all probability, in Roman times, a bridge here crossed the stream. Whether it was ford or bridge, however, it is certain that a strong tower—possibly a water-gate—terminating the city-wall towards the river here, guarded its passage, as the foundation-walls have been excavated entire. Standing on the mound which marks its site, I saw before me the silvery Severn winding amid a thickly-wooded country, once, doubtless, a forest teeming with wild boar and red deer. On the opposite shore, the old military Roman road, as yet strongly marked, running between hedgerows, but grass-grown like the fields. The scene was so calm and little disturbed by man, that the imagination could easily picture the Roman legions wending towards the next great military station, their eagles flashing in the setting sun.

DINING-ROOMS FOR THE WORKING CLASSES.

If Glasgow can teach the London artisan how to dine well for fourpence-halfpenny, the Scot will do him a great service. At the present moment the labouring man in this great metropolis pays more extravagantly for the two items of house-rent and food, according to what he gets, than any of the classes higher in the social scale, for the simple reason that he is a retail purchaser in both commodities on the smallest possible scale. But as he is at the same time a member of the largest class, and the only one that pays *ready money*, he has only to club with his mates to stand in the position of a wholesale customer on a scale which dwarfs to insignificance the purchasing powers of all other classes. The operatives of Glasgow, or rather those who have undertaken to cater for them, have been the first practically to appreciate this fact; hence the success of the dining-rooms for the working classes in that city. Manchester, we are told, is about to follow this good lead; and London has already two associations threatening to compete with our cook-shops and alamode-beef houses. The great merit of

the Glasgow plan is, that these dining-rooms are self-supporting. The tariff at which the refreshments are sold not only pays, but leaves a small profit. There is no petting on the part of lofty philanthropists who, on the score of a twenty-pound subscription, condescend to superintend the tastes and appetites of the working man. Another good feature of the scheme is, that only the best food is supplied. Only those who have had a long acquaintance with the artisan, know how particular he is to have the best his means will afford. This may look like extravagance on his part, but it is really true economy, and possibly lies at the bottom of that superiority he boasts over the *ouvriers* of other nations. A correspondent of the *Times* tells us that for fourpence-halfpenny he got in one of these dining-rooms "a pint of pea-soup, a plate of hot minced collops (beefsteaks minced and stewed), a plate of potatoes, and eight ounces of bread," all far better in quality than could be got at a railway tavern, —a pretty good dinner for the keenest appetite, and infinitely more nutritious than that provided for the workman in his own home. The *carte* from which he has to choose is not very ample, it is true, but there is range enough, with two exceptions, to satisfy any ordinary appetite. But these two are, however, worthy of note. For instance, why should a working man be compelled, by the rules of these dining-rooms, to eat beefsteaks and roast beef from morning to night, and from one year's end to the other? Surely, this is only repeating the error under which our soldiers so long suffered, and which not only disgusted,

but physically impoverished them. We are asked to approve this bovine monopoly, on the score of the simplicity of the arrangement, by "J. O.," in the *Times;* but, on the same principle, oatmeal would have far higher claims. Variety is as essential to the working man, in the article of food, as to the rich man, who, if he had to dine off beef day by day, would, we fancy, sing that national song, "O the Roast Beef of Old England," to a less cheerful air than he does at present. And why, we ask, is the working man to have no beer? Surely these establishments are not set up in order to carry by a side-wind what teetotal societies have failed to accomplish in a direct manner. We sincerely trust that the promoters of the London scheme will not follow the lead of the Glasgovians in this particular, as we feel confident of its failure if it does. We will back the eating-house, with its bad meat, its hot steam, its dirty benches, and its slatternly waiters, but where the guest can order his pint of half-and-half from the "Red Lion" over the way, against the best appointed working-class dining-room that Glasgow can show that is worked on the cold-water system. We should be sorry to see these improved restaurants turned into drinking-places; but surely Temperance herself would not "deprive a poor man of his beer" at dinner. Drunkards are not made temperate by such means, and the really temperate will not brook any such interference with their ordinary habits. It will be remembered that an attempt was made by philanthropists to put down smoking in village clubs and

reading-rooms, and the total failure of these institutions in consequence should not have been lost on those who have engaged in this new movement. Nothing is more difficult than to change the food and drink of a people, and any attempt to do so suddenly or unnecessarily is sure to end in failure. These, though important errors in the scheme of management of the Glasgow Working Men's Dining-rooms, are counterbalanced by much that is excellent. The plan of pricing every article offered at a penny (with the exception of meat) is excellent, as it enables the hungry man to arrange a dinner so as exactly to suit his coppers. Let us contrast such a repast as an artisan will soon be able to get in any quarter of London, with that he at present obtains. If a carpenter, or a bricklayer, or a road-maker is engaged any distance from home, his dinner-hour is spent generally as follows :—When the bell rings to knock off work, he generally throws himself down on the ground and has a snooze, until his wife, who "stokes" him, performs this operation by means of a basin filled with potatoes and cabbage, and generally a piece of bacon; his fingers and a clasp-knife enable him to complete his rude repast in a manner but little removed from that of the hound in the kennel. To such a man the decent cloth, the seat, the well-ordered room, the soup, the collops, and the slice of plum-pudding, would be so many elements of civilization, all tending to lift him in the social scale, and to give him that self-respect without which there is no true manhood.

Whilst, however, to a vast number of the bachelor portion of the artisans, and those who, as we have said, work so far away from home as to prevent their returning to dinner, these Working Men's Dining-rooms will prove of infinite value, we may perhaps be allowed just to hesitate a doubt if their effect upon the family life of the workman will be good. It will be remembered that during the controversy in the *Times*, "How to Live on Three Hundred a Year," it was asserted that young men were spoilt by club life and club dinners for domestic life. How will it be with the young artisan, accustomed to the luxuries of his dining-room, when he takes to himself a wife, and has to share with her the ill-dressed flaps of meat that generally fall to the share of the poor man? And how will it fare with the poor wife in those cases where the husband is enjoying himself on soup, and roast, and pudding, in his well-lit, well-warmed, spacious dining-room? In Glasgow and Manchester, where there is no domestic life for the factory hand, and where husband, wife, and child alike toil in the mill, these dining-rooms are a godsend, and indeed a necessity; but in London the case is somewhat different; and the social meal spent together is certainly an element of domestic life worth maintaining, and we trust it will not be shaken by the introduction of this new Glasgovian scheme. It is not only the mid-day meal that is threatened with revolution, but all other meals. For twopence a man can get a pint of excellent coffee, with milk and sugar, and four ounces of buttered bread, so that he has only to hire a bed, and here is

his board found him for about seven shillings a week. It may be asked, can a working man spend even so much for food simply on himself, when he has a family? The better class artisan, certainly; but the labourer, whose wage is not more than a pound a week, No. This leads us to the reflection that in all these improvements the class that takes advantage of them is far above that for which they were intended. This was proved when model lodging-houses were first established. These were intended for working men only, but it often happened that reduced gentlemen were found in them; and on occasions of excursion trains arriving from the country, well-dressed people carrying carpet-bags were often found demanding admission for the night. The pressure of class upon class is, however, so great, that it is often difficult to say whether the wearer of the fustian jacket or the seedy black coat is the better off. At all events, when these dining-rooms are self-supporting, it matters little what rank in the social scale frequents them, as they can be extended *ad libitum*, and they violate no principle of political economy. It is, however, far otherwise when such schemes are supported by public subscriptions, for then the philanthropist enters into unfair competition with the honest tradesman, and in the endeavour to minister to the needs of the poor, runs a chance of pauperizing respectable people. A knot of active, well-meaning persons of this class seem to have stolen a march upon those who are about to establish dining-rooms on the self-supporting system,—now working so well at Glasgow,—and

advertise "The London Association for the Establishment of Dining and Refreshment Rooms for the Working Classes." This scheme is to be partially supported by donations, and we see that the honour of managing or mismanaging the affairs of the association is to be purchased for £10 and £25 respectively. Of course a number of wealthy busybodies can always be found to appropriate other people's ideas, but there can be no doubt of the fate of an establishment presided over by such a management. To start with, they propose a bill of fare which is as extravagant as that of Glasgow (in the shape of meat, at least) is meagre. Here it is :—

Soups.—Meat soup, jullienne, soldiers', and vegetable, each 1d. per pint.

Fish.—Cod, 1d. ; plaice, 1d. ; and toad-in-the-hole, 1½d. for 8 oz.

Joints.—Leg of mutton, 2d., 4 oz ; salt boiled beef, 2d., 4 oz. ; stewed fresh beef, 2d., 4 oz. ; beef pudding, 3d., 10 oz. ; soldiers' meat, dumpling, and potatoes, 3d., 16 oz. ; beef pies, 2d. ; and "India pot" (a very excellent, substantial dish, cold), 3d., 16 oz.

Miscellaneous.—Kidney and Scotch tripe, 2d., 6 oz. ; curried tripe, 3d., 10 oz. ; tripe toad-in-the-hole, 3d., 10 oz.

Puddings.—Indian, 2d. for 8 oz. ; Yorkshire, 2d., 8 oz. ; honey-balls, 2d., 8 oz. ; polenta (sauced), 1½d., 16 oz. ; ditto (cheese), 1½d., 16 oz. ; sandwiches of new mixture, 1d., 4 oz.

Vegetables, &c.—Carrots, greens, turnips, brocoli sprouts, ½d. per plate each ; kohl cannon, ½d. for 4 oz. ; bread, ½d. for 4 oz. ; and butter, 1d. for 2 oz ; coffee, ½d. for three-quarters of a pint ; cocoa, 1d. per pint ; tea, price not yet fixed.

We should say such a *carte* as this will require the contributions of the affluent; and whilst the guest delicately sips his soup jullienne and relishes his fish and curried tripe, he will without doubt bless the benevolent individuals who provide him with such

excellent fare at so small a charge. The extravagance of such a scheme will, however, correct itself, and the alamode-beef house need not fear any prolonged competition from this charitable institution for feeding the million.

We have, however, the word of Mr. Warriner, the Instructor of Cookery to the Army at Aldershot, that this bill of fare is even more economical to the association than that used in the dining rooms in Glasgow. If this be really so, what need is there of donations? On the contrary, it should give a greater profit than the self-supporting Glasgow scheme. "Answer me that, Master Brooke!" At all events, whichever scheme succeeds, the working man in search of a good dinner will be sure to be a gainer, and we trust also that the publican will be a loser, which he certainly will if these dining-rooms alter a very obnoxious rule, and supply the working man with his pint of sound table-beer to wash it down, in place of the salted, tobacco-flavoured liquor, cunningly contrived to make him thirst afresh, which he will find in every public-house in London.

"SILVERTOWN."

THE boy's most popular notion connected with India-rubber is, that it is good to make "bladder pop;" and in order to make this material, it has to go through a process of manufacture which comes to boys by a kind of instinct. We all remember, during "map days," how the india-rubber, too often called into requisition, grew hot and crumbled, and as the pieces broke off, how they found their way into the mouth to undergo the process of mastication, and how, when chewed to a proper consistency, it became ductile, non-elastic, and sticky,—qualities requisite to make it imprison the air, which, on pressure, forced its way through the yielding substance in the shape of bladders, that burst with a pop, the sole reward of the schoolboy for hours of very tiring jaw-work. How little we imagined, when employed in this manner, and enjoying by anticipation the simple pleasures of the final pop, that we were going through a process which Science has since indicated as the best method of manipulating india-rubber for the purposes of the domestic arts. In the powerful machinery employed by the manufacturers of caoutchouc, we see but an elaboration of the masticating

powers of the boy's jaw, which, with the heat of the mouth, works up the sixpenny square of india-rubber into the substance we are all so well acquainted with.

We paid a visit, the other day, to "Silvertown," the little manufacturing village at North Woolwich, belonging to the Messrs. Silver, in which the many substances into which india-rubber can be transformed are produced by the powerful and curious machinery there at work; and it was whilst watching the different processes that we came to the conclusion that the boy is father to the man, even in a manufacturing capacity, as we have already hinted.

How little we are able to forecast the uses to which a new material may ultimately be applied, is perhaps as much evidenced by this substance, caoutchouc, as by any other in existence. As far back as the year 1770, Dr. Priestley, in the introduction to his book on Perspective, says, "Since this work was printed off, I have seen a substance excellently adapted to the purpose of wiping from paper the marks of a black-lead pencil. It must, therefore, be of singular use to those who practise drawing. It is sold by Mr. Maine, mathematical-instrument maker, opposite the Royal Exchange. He sells a cubical piece of about half an inch for three shillings, and he says it will last for several years."

How little this philosopher imagined that a substance thus incidentally mentioned in a drawing-book was destined to become one of the most useful substances in the arts and sciences—nay, to be an absolute necessity of civilization.

It is at the same time very remarkable that for upwards of sixty years india-rubber never advanced beyond the hands of the drawing-master; and that, during that long period, all its virtues were supposed to consist in its power of correcting schoolgirls' drawings. How many substances are there still before the world in a like condition of embryo?—what is to be the splendid future of gutta-percha, aluminum, and the other scores of new substances that are beginning to "crop" up around us?

It would seem as though it were destined for the rubber plant to play a great part in the world, as it is found in great abundance in all parts of the globe within tropical latitudes; and, like the palm, it is probably destined to do the missionary work of civilization far more effectually than any of our societies constituted for that purpose, as the pursuit of these two valuable products will lead organized bands of European traders deeper and deeper into the recesses of the tropical wilderness, where the solitary missionary could not hope to make any permanent lodgment.

The best kinds of caoutchouc are the Para and the bottle india-rubber. The latter is familiar enough to the reader; but perhaps it is not so well known that what is termed caoutchouc is the milk-sap of trees, and that this juice is to be found in many other trees besides the rubber-tree; indeed, there seems to be little doubt that we may draw upon a large portion of the tropical vegetable world for this valuable material. The india-rubber as imported takes the form of bottles, and there is a kind known as negro-head, possibly because

when cut open it presents an appearance somewhat like that of a human brain with its numerous convolutions. The first process we witnessed at the Messrs. Silver's was the softening of these bottles and "negro brains," if we may use the term, in a large tank filled with warm water. The rubber is macerated here for some hours, for the purpose of softening and cleansing it—the process it undergoes in the school-boy's mouth. When it has been long enough in the water, it is taken to the masticating machine, which is a kind of calendering apparatus, heated by steam, and operating upon the lumps of rubber as the boy's grinders do. You see the big lumps drawn in between the smooth cylinders, apparently the most obstinate, indigestible, unmanageable stuff in the world, and after a while it issues from the other side in the form of so many "brown-bread towels," or those coarse-looking, oatmeal-coloured rubbing cloths that are a necessary appendage to every sponging-bath. The transformation from the dirty-looking lumps of rubber to these little towels, about eight inches wide and three feet long, is the oddest thing possible. As they emerge, they are folded up and placed on shelves, just as we see them in baths and wash-houses. Twenty-four hours' exposure to the air changes their oatmeal colour to a very dark brown. This is the first stage through which all the different preparations of india-rubber go—its cleansing process. The reader will possibly remember that india-rubber presents itself under different aspects, either as pure india-rubber, such as tobacco-pouches, &c., are made of, or as

whitish-looking india-rubber, which we are familiar with in the form of macintosh-cloaks. The vulcanized india-rubber has a somewhat similar aspect,—a clay-like colour, as far removed as possible from the rubber as we see it in the bottle. Pure india-rubber is manufactured in a very simple manner. A number of the brown-bread towels are taken to the Masticator, a machine composed of two powerful steel rollers, revolving with unequal velocities, and heated by steam. The towels disappear in this powerful mangle, and the act of mastication begins. As towel after towel disappears, the rubber is worked into a huge bolster, which is masticated over and over again, until it assumes the form of sticky pulp,—"bladder pop," in fact, on a large scale. The bolster is now taken from the machine, and placed in an hydraulic press, one foot wide, nine inches deep, and six feet long. Here it remains for two days under a pressure of fifty tons, and comes out a solid block of homogeneous india-rubber, big enough for a Titanic drawing-master. It has now to be cut into sheets. This is done by placing it in a machine fitted with a cutter, which cuts with a quick lateral or saw-like motion. The block is pushed forward against this cutter, and the thickness of the sheet can be regulated to the hundred-and-twentieth of an inch: indeed, sheets of that tenuity are sometimes made. It is a pretty sight to watch the thin film of rubber being detached in this way with an unerring accuracy.

The most important application of india-rubber in this form is its use as an insulator for telegraphic

purposes. Hitherto, gutta-percha has been almost universally employed—for deep-sea cables especially; but there can be little doubt that india-rubber is a far more durable material, and it is slowly coming into use, notwithstanding the opposition of the manufacturers who have embarked large capital in the collection and working of gutta-percha. It is one of the most interesting sights in the manufactory to see the machinery envelope the telegraphic wires with its non-conducting rubber sheathing. This is done by winding round them spirally thin bands of rubber by machinery driven by steam-power. Thirty or forty spindles for this purpose are seen revolving in a large room, and hundreds of miles of wire are thus covered in the course of the week. The covered wire is subjected afterwards to heat, which fuses the laps of the covering riband of rubber together, and thus makes it impermeable to the entrance of water, and effectually prevents the escape of electricity.

The process of manufacturing soft india-rubber is more elaborate. What is termed spread sheet india-rubber, or that kind of which waterproof garments are manufactured, is made by masticating, and mixing sulphur in the proportion of two ounces to a pound of the rubber, and then dissolving it to the consistency of dough by the admixture of naphtha. When in this soft state it is passed through finely-adjusted rollers and spread out into thin sheets; these, as they emerge from the rollers or rolling-pins — for the rubber is spread out like so much dough,—are passed over a steam chest, which drives off the naphtha, and dries, to

a certain extent, the material. In some cases, the film is rolled on to a cotton fabric and adheres to it, film after film being added until it is built up to the required substance: the object of this building up being to prevent the possibility of air-holes occurring, which would be fatal to a waterproof or airproof material. When it is not necessary for the india-rubber to be lined with cloth, the roller of that material on to which it is wound is sized; consequently no adhesion takes place between the two materials, and the rubber is easily peeled off. The process of vulcanization that gives such extraordinary resiliency to the material, which we are so familiar with in the form of india-rubber bands, springs, &c., is accomplished by the application of heat. The sulphur having already been worked into the material, and thoroughly incorporated with it, the articles made of this hard compound are carefully packed in sand so as not to touch one another, and then are run into steam chests, where they remain from two to six hours, according to thickness, at a heat varying from 200 to 300 degrees. This application of heat turns the soft doughy substance into the famous elastic material which, under the name of vulcanized india-rubber, is even invading the province of steel in the manufacture of springs. What is the nature of the chemical change which takes place when this final increment of heat is applied is entirely unknown, and the discovery itself was one of those fortunate accidents which have so often produced noble fruit. The peculiarity of the elasticity produced by vulcanization is, that its power

never seems to be worn out. The bow must be unbent, if its force is to be husbanded; but an india-rubber band may be kept stretched to its utmost limit for years, and it will still retain its wonderful resiliency.

But we have yet to describe another process — that of manufacturing hard india-rubber. To Goodyear, the American, the merit of this great discovery is due; for great we must call it, inasmuch as it has introduced into the arts and sciences a material somewhat similar to horn, but which possesses qualities far surpassing that natural product, and which can be made in any quantities and in any sizes.

In this new material a very large amount of sulphur is used: to produce mere vulcanization two ounces to the pound of rubber is sufficient; but to make hard india-rubber, or ebonite, as the Messrs. Silver term their preparation of it, as much as two of sulphur to one of rubber is used. The application of great heat, say 300 degrees, transforms the india-rubber thus treated into a material more resembling to the eye ebony than anything else—a dense black substance, which takes a high polish, is very light, and to some slight extent elastic. The uses to which hard india-rubber is put can scarcely be enumerated. In many articles it is entirely displacing horn and tortoise-shell. Hundreds of tons, for instance, are sold to the comb-makers; for paper-knives, handles of all kinds, bracelets most closely imitating jet — but with this advantage over that material, that it will not break by falling on the floor—cups and troughs of all kinds, and especially those for the use of photographers, as

neither acids nor metals have action upon it; in short, we scarcely know to what this beautiful hard substance is inapplicable, so multifarious are the uses to which it has already been applied. It is greatly used as an insulator in telegraphy, in consequence of its non-conducting quality; and moulded into forms before being baked, it takes the place of many articles formerly made of gutta-percha, to which material it is infinitely preferable, as it is neither affected by heat nor cold.

The little community of Silvertown is, so to speak, self-contained. Situated, as it is, far away from the town, on the Essex shore of the Thames, the proprietors had, as it were, to found a little colony. When the factory was built, there were no houses near, and no market, consequently the Messrs. Silver had to provide for the wants of their workpeople, and they certainly have done so with a care worthy of all praise. The rows of cottages in which many of their workpeople are housed contrast very favourably with the squalid habitations one passes on the railway in going to the factory. Then there is a store in which bacon, flour, and many other necessaries of life are obtainable at cost price, and a public-house in which the beer is pure. The Messrs. Silver found it was incumbent upon them to build a public-house, otherwise it would have been done for them by independent parties, and the consequence would have been that a very efficient means of administering to the comfort of the workpeople, and at the same time of controlling excess, would have passed out of their hands.

The great charge brought against the manufacturers,

as a class, used to be that they were utterly careless with respect to their "hands," and that they looked upon them merely as machines — or rather less than machines—for when their day's task was done, they washed their hands of them, and cared not what became of them; a state of things which placed the free Englishman, as regards physical comfort, in a less favourable position than the negroes, whose bodily wants their masters have always had the good policy to attend to. In thus making themselves responsible to a certain extent for the domestic comfort of their workpeople, the employers are doing service to the community at large, for it is to the exertions of individual manufacturers that society must look for the accomplishment of that all-important task the elevation of the social status of the workman. The example of little communities such as Silvertown is beginning to tell upon that mass of squalor which once seemed to be so hopeless in its immensity. It is becoming a habit of large manufacturing companies, we are happy to see, to look upon their workmen as human beings, to be cared for, rather than as machines, to be used up; and the formation of the two little colonies of engineers at Wolverton and Swindon has been followed on a smaller scale by thousands of private employers throughout the country, who have found out that their own interests are concerned in concerning themselves with the happiness of those in their employ. The Messrs. Silver may justly pride themselves in belonging to the noble brotherhood of scientific men which is doing such good service to the

RAILWAYS AND CITY POPULATION.

In the infancy of Railroads many towns viewed them as of old pest-houses were viewed, and drove them far off as intolerable nuisances. After awhile, however, these sapient municipalities found themselves stranded high and dry, whilst they had the mortification of seeing the main stream of life and commerce passing through hitherto unimportant hamlets, and suddenly swelling them into towns of consequence. One would have thought that a lesson still fresh in the minds of most middle-aged persons of the community would not have been without its influence, and that in these days citizens and the Legislature would be as ready to receive the rails into their midst as they were of old to banish them afar off. But if we are to believe the statements of a few noble lords of the Upper House, metropolitan lines are still greater nuisances than were the lines of old traversing the country.

Lord Shaftesbury thinks the Great Eastern Railway Company ought not to possess themselves of Finsbury Circus. Open spaces are so many lobes of the metropolitan lung, without which the "tailors and shoemakers" cannot breathe. So far so good; and

speaking generally we agree that we should rather multiply than diminish such wells of fresh air; but it does seem rather extraordinary that in the very next breath his lordship is found complaining that upwards of a thousand houses will be cleared by this same company for the continuation of its main line and branches into the metropolis. Now, to make a line is to make a very wide street, and to open up avenues of fresh air. In the one case the company are flagellated for building in an open space, and then, again, they are threatened with the lash for wishing to open new ones. It is quite clear that, hit high or hit low, his lordship is not to be satisfied.

Then, again, we have a dismal picture painted by his lordship of the fever jungles in which tailors and shoemakers are obliged to live; and yet, when it is proposed to ventilate these fever districts with open lines, the hardship of turning them out "at a week's notice" is insisted upon. In our opinion, the only way to get rid of the pestilential nest of dens in which the working population of this metropolis at present live, is to separate them by moving among them railway lines in every direction, and in this manner disintegrating and breaking them up, just as the police do dangerous multitudes, by moving among them wedge-like divisions of their force.

The Great Fire of London, which swept away the old town, was a mercy attended no doubt with much suffering; but we believe that the introduction of the scores of lines which are intended to form links of intercommunication between the great stations in the

suburbs will end in a second destruction of London—a London, we may say, that, with all our boasting, is not in its back slums very much in advance of that of two centuries ago.

The look of Mr. Stanford's Map of the Proposed Metropolitan Railway Schemes for 1863 is, at first, appalling enough, but it is quite clear the new lines make a greater appearance on paper than they will in reality, as many of them are to run underground. A very important feature of most of them is that they strike at the very heart of the metropolis instead of keeping in the far distant background. No doubt this very boldness will raise up opposition against them; but, as far as we can see, wholly without cause.

The dealings of the great masses of the population are with the old channels of communication; we want to get into the great thoroughfares and the great centres, and not into far-off boulevards and shabby half-populated neighbourhoods. The great drawback, for instance, of the Metropolitan Line is, that it runs far away from the points to which Westenders are mainly bound. Watch the lines of omnibuses, and where they gather thickest there the pulse of population throbs the fullest.

We hear people expressing horror at the idea of a railway station at Regent's Circus. Of course, if it were proposed to run trains, or even to open an underground station, in the centre of this crowded thoroughfare, the scheme might justly be pronounced absurd. But would it be supposed, from the outcry,

that the plan is to clear away an open space for a station in the frowsy cholera district lying between Queen Street and Brewer Street, near to Golden Square, in order to put the many great roads that debouch close upon this spot in railway communication with the Great Northern station and the northern district of the town?

Go near to the great centres of traffic! Of course they do, just as fishermen make for the densest part of a shoal of herrings—for railway companies are but fishers of men. Then, again, we hear loud complaints against the route of the Kensington, Knightsbridge, and Mid-London line, because it proposes to run from the Great Western station, under Kensington Gardens and Hyde Park, and under Piccadilly to Leicester Square, and so on.

Now, if there has been one road more demanded than another by the public voice, it has been one through these public parks, which, as far as public carriages are concerned, divide in half two of the most important portions of the town night and day, and during the hours of darkness even pedestrians.

We know an underground line would do all that the public needs, and leave the greensward intact; yet the scheme is denounced, because for a short time it may necessitate some unsightly earth-heaps appearing there. A great sewer may be driven at a vast depth, and with infinite mess, along the same route, but a tunnel for the circulation of the people rouses an indignant population of objectors.

We have seen Leicester Square cumbered by a

private speculator with a most hideous building, without a word of protest on the part of the inhabitants; and we have seen the same building cleared away, and the site devoted to the purpose of a vast dust-heap, and yet the proposition to erect a comparatively low building for a most useful purpose is met by a yell of derision.

If we kept our public spaces as well as they do abroad—planting them with shrubs, and laying them out with flower-beds and public fountains, into which the public had a free right of entry,—the cry of those who are for protecting our open spaces would be tenfold more reasonable than it now is, considering that we lock up our squares, and rigidly exclude the great unwashed from touching its sooty and desolate-looking sod. If our open spaces are to be anything more than the "potatoes and point" of the Irish peasant—their flavour only to be enjoyed in imagination—we do not see that the public have so very much to lose by their appropriation, here and there, as railway-stations.

There is one argument, however, on the part of those who are frightened at finding the metropolis threatened with being carried by the railway companies by assault—an argument, by-the-bye, which even the *Times* has not hesitated to use,—namely, that "cities are meant to live in," and not to be cut and carved about by railway companies. Now, that cities are made to live in seems a very obvious truth, but in reality sometimes it is not a truth at all. The city of London, for instance, is almost wholly deserted

at night; the railway companies and the omnibuses every evening disperse the vast crowd to surburban houses, and return it in the morning.

This attraction and repulsion from the central heart is going on year by year with redoubled force, and the end of it will be that railways, instead of condensing and compressing human beings together by reason of the room they take up, will spread the population over an area twentyfold the size they at present occupy. The time will come, no doubt, when London proper will consist of a series of vast suburbs connected by railroads with a central business district.

Foreseeing this tendency of the time so clearly, we cannot but smile at the fears of those who apprehend that railways are about to exclude every mouthful of fresh air left to us. There are certain classes of the population who must be, at all times we suppose, resident citizens; and they will get more air in consequence of the flight of the wealthier portion of the population towards the suburbs; but we by no means apprehend that large portions of the working population are necessitated to dwell close to their work.

In our opinion, the Legislature should exercise its authority over the railway companies in the direction of obliging them to run early and late trains at such times and prices as would meet the means and needs of the working classes, rather than begrudge them station space, in order to conserve the wretched dwellings that Lord Shaftesbury's "tailors" and "shoemakers" now inhabit, at a rent far higher, considering their accommodation, than his lordship and his class

pay for their own houses in the comparatively pure air of the West-end.

We confess we do not put much faith in the value of the promised edict of the Board of Trade. The want of system in our railway communications cannot now be mended by the hurried consultations of a few officials. To attempt a consolidation of the different lines, such as shall give a free intercommunication between all parts of this vast metropolis, on any symmetrical plan, considering the want of symmetry that already exists in the exterior lines themselves, would be like attempting to mend a Gothic building by piecing it together with Greek work. All that we can now do is to gather up the ends of the different threads of communication in the best way we can, leaving that way to the ultimate judgment of the shareholding public.

ADVERTISING.

It is high time that the art of Advertising should form an important element of education at our commercial academies. Of what consequence is it to a youth who is destined to become an energetic member of the clothing profession, or a pushing grocer, or a cutting baker, that he should load his mind with items of Roman history, or rack his memory with that promiscuous number of questions and answers Miss Mangnall has left behind her to the misery of schoolboys?

The first duty of a tradesman is to puff his goods, and the boy that is to be brought up to trade should be carefully inducted into the art and mystery of doing this in the most skilful and original manner. Mr. William Smith, [illegible] of the Adelphi, should be elected the first professor of this art, for he has just published a little work in which he very clearly sets forth that the chief use of all created things is to serve as an eligible medium for advertising. He would stick a poster on the moon if he could reach it, whilst nothing is too small in his eyes

as an advertising agent. Let us quote from his pen a familiar example :—

> The trays used for taking in grogs, or the stouts, could be turned into an advertising medium by having a centre and several divisions, like the spokes of a wheel, and enclosed in a circular margin. The rim, the centre, and every one of the several divisions could contain an advertisement either painted on or prepared with rice paper, and the same, paid by the advertiser, would leave a good profit over the expense of the tray manufactured in Birmingham.

Mr. Smith, like Napoleon, is too great a genius to be in the slightest degree influenced by the inconvenience his schemes cause to others ; nay, he even calculates upon that inconvenience and trouble as one element of success. For instance, during the run of the "Dead Heart" at the Adelphi, he caused 10,000,000 adhesive labels to be worked off, shaped in the form of a heart, and inscribed with the name of the play, and these he instructed his agents to stick on every object, animate or inanimate, they came across. A gentleman returning from a dinner party, for instance, is found by his wife to have one of these labels pasted on his best dress-coat and three inside his hat, whereupon the lady indignantly protests against the impertinence, and adds, "It took me full an hour to wash it off."

A genius less far-seeing than the author of "How to Advertise" would have felt some compunctions of conscience on the receipt of such an epistle. Not so Mr. Smith: on the contrary, he chuckles at her indignation, and adds, with the air of a man conscious of having done a clever thing, "The lady little thought

what publicity she was giving to the piece by communicating with her friends on the subject." Surely the force of advertising impudence could no further go. Mr. Smith is great upon pictorial advertisements: he would have all tradesmen shape their trade-cards according to the form of the article they sell. The butcher should have his card of the shape of a leg of mutton; the poulterer should put into your hands a well-drawn turkey, inscribed with his name and address; Mr. Moses, instead of throwing away showers of books into cabs and omnibuses coming from the railway, should have cards made in the shape of a paletôt. No doubt this advice is sound, as we all know how indestructible an article is a card, and how it turns up from time to time in our drawers. But it is not enough to have a card clearly printed: it should have a loop of riband to hang it to a nail. Mr. Smith, who knows how much success depends upon trifling details, is very great upon the loop of silk.

But to leave Mr. Smith and his devices, we may survey for a moment, with wonder, the power of the advertisement viewed in its multifarious modes of application. There is Mr. Holloway, for example, who, by the mere force of money and Lord Aldborough's leg, has managed to scatter his salve-pots and his pills broadcast over the face of the earth. Many legs have been made famous,—that of Miss Kilmansege, of Madame Vestris, of Lord Anglesey; but what does the world know of them compared with the afflicted member of this noble lord, which is paraded before the eyes of the four quarters of the

globe, at an annual expense of £40,000 in advertisements? We hope the question is not an impertinent one, but we really should like to know from Professor Holloway what annuity he has settled upon that noble lord for the never-dying liberties taken with his sorely afflicted extremity? Any man, with an expenditure of £40,000, and a British nobleman's leg as stock in trade, is pretty sure to go in and win; there is no ingenuity required, no flash of genius needed, to insure success. We feel no particular interest when the end is obtained by the dead weight of gold. Advertising, considered as one of the fine arts, on the other hand, opens up a fine field to the mind. In this line of art the mere dull iteration of an advertiser gives place to fancy, curiosity, wonder, sometimes a sense of incongruity as to time and place, which irresistibly impresses the mind. Miss Martineau, when in Egypt, saw "Warren's Jet Blacking" written in large white letters a yard high at the base of one of the Pyramids. What person who saw this simple announcement ever forgot it? The person who had the wit to ask, "Who's Eliza?" on every wall both in and out of town, calculated justly upon the amount of curiosity it would create, especially as the query was repeated from week to week; and Dickens did not think it beneath him to profit by the hint when he posted the walls last Christmas with "Somebody's Luggage." We were struck very much the other day by seeing on the walls in whitewash the question, "Who's Griffiths?" followed by the exclamation, "Thieves! Thieves! — Fire! Fire!" a clever method of advertising a Patent Safe.

This was the style inferential, which Warren made the public familiar with years ago in a pictorial manner, when he depicted the cat spitting at her image reflected in the well-polished boot. There is room for keen wit in advertisements; but we fear the trading mind rarely is equal to it. The tea-dealer, who put up as his sign a tea-chest, and inscribed upon it "Tu doces," was clearly above the ordinary sort of tradesmen.

There are literary tradesmen, who turn every event to their own advantage in comic verse; but the true style of poetical advertising went out when Robins died. His advertisements sometimes rose to a height of grandiloquence which really showed genius. For instance, when, on one occasion, after describing a terrestrial paradise, he had the art to make this reservation:— "In fact, there are but two drawbacks to this property, the noise of the nightingales and the litter of the rose leaves." We wonder what has become of the poet Moses used to keep? It is a long time since we have been taken in by a flowery poem ending in the celebrated "Mart." Possibly, like Southey, he is equally great in prose or verse, for Messrs. Moses have lately, we perceive, put in circulation an essay, entitled "Gossip on Dress; or, Half an Hour's Amusement for our Friends and Constituents;" and we are compelled to say that this pamphlet is very amusing, and tells us some facts that are new to us. And we can quite forgive the conclusion the essayist comes to, that "people should be almost as particular in the selection of a tailor as in the selection of a family physician;"

or the very palpable hint that that tailor is the inevitable Moses. This little essay marks a new era in advertising, and it certainly is far more calculated to gently instil the wishes of the advertiser than the old stereotyped puffs of that firm.

It is, we think, of vast importance to a man wishing to bring himself prominently before the public, that he should have an uncommon name. If William Smith, for instance, were to advertise his "hats," nobody would remember anything about him, but we defy any person to forget that Harper Twelvetrees gets his living by his Bug-Destroyer. If we were determined to advertise any article, and possessed a commonplace name that would not stick in the public memory, we should take a fresh one for commercial purposes—a good sticking cognomen that would not be forgotten.

In advertising, it is well to beware of feeble attempts. If a man has capital, he should go on until his name might stand for the leading article he sells. For instance, "Watherston and Brogden," in the public eye, are synonymous with gold chains. If we called a table-knife a "Mappin," the term would be understood, and time was when a "Doudney" would be translated "over-coat." This firm somehow seems to have dropped out of the advertising world; since it has moved westward probably it has grown too genteel to advertise. We question if the public take any heed of the scrawls with whitewash upon walls. It seems, at best, but a cheap and nasty method of puffing goods; moreover, we think people resent the

liberties advertisers sometimes take with private property in this way, and we know they do when public property is made to act as boardman in this impudent manner. For instance, we saw one of the bridges the other day daubed over with the injunction, "Buy your clothes of Moses and Son," and a certain literary journal some time since posted over all the lamp and other posts along the Bayswater Road with puffing posters. This was a great mistake.

There are certain times when a man is in a mood to read an advertisement, and others when he is not. Two-thirds of the persons, for instance, who have to despatch their breakfast and skim the cream from the *Times* in ten minutes, never look at an advertisement; in fact, the "double supplement" is only useful to those persons who are in want of something — a very large class,—and not to the mere newsmonger.

There are two places, however, in which we always notice an advertisement, especially a pictorial one — the suburban railway-station and the splash-board of a Hansom cab.

When the mind is undergoing any suspense, it is singularly alive to little trifles that come within its cognizance. Dickens has illustrated this fact in the Trial-scene of Fagin, who, whilst his fate is pending in the jury-box, falls to counting the rails in front of the dock, and wonders how they became broken, and when they were dusted last.

This extraordinary attitude of mind is often found in the railway traveller, who, in a moment of excitement or anxiety, finds himself pacing up and down a

platform waiting for a train. On such occasions the reader will, perhaps, remember how deep an impression was made upon his mind by the drawing of Clarke's gigantic manglewurtsel, or of the pictorial illustration of the effect of Thorley's Food for Cattle.

The best spot in the whole world for an advertisement, to our mind, is the little oval splash-board of the Hansom cab which faces you as you sit down. A ride in one of these vehicles is very exhilarating, and the effect upon the brain is to impress objects upon it vividly. Again, it is the only object in the foreground to be seen; and, without doubt, an advertisement in this situation is more deliberately read than in any other place in the world.

Yet what a wide subject Advertising is, and how many people successfully perform it without letting others know what they are about! But the subtle and indirect method of doing it belongs to the Fine-art of Puffing.

A DAY WITH THE CORONER.



The life of a Coroner in a mighty metropolis like London must be an odd one. His grim duty leads him day by day into palaces and cottages, back-slums and noble mansions. In a certain sense he is a modern Charon, whose pass is required ere a company of corpses, some days more, some days less, can find quiet burial. They say ghosts listen for the sound of the crowing cock before they retreat to their narrow beds; so mortals, suddenly deprived of life, must have the permit of twelve good men and true and the coroner's signature, ere the sexton will lift a shovel in their behalf.

Being desirous of having one day's experience of the accidents and offences which pick out, as it were—we will not say by accident, for there is a natural law in these cases as in all others—the lives of a certain per-centage of our population, I asked permission to accompany my friend, the able medical coroner for the central district. Permission being obtained, I was ready at the office at the appointed hour. "Now you must be prepared," said my friend, "for a good hard day's work. Here are nine cases," said he, consulting

an official paper as a gourmand would a bill-of-fare; "I don't know what they are, or how they will turn out." In short, it was a kind of invitation to take pot-luck.

Our first visit was to Middlesex Hospital, and our first duty to visit the dead-house. Even to those accustomed to the presence of death there is something very startling in the sudden transition from the life and noise of a great metropolitan throughfare to the dead-house of a large hospital, tenanted by silent inmates such as these, who but a few days since moved in health and spirits amid the hubbub, dreaming not that they were on the edge of that bourne from whence no traveller returns.

Three blackened deal coffins, placed side by side, with their lids removed, revealed the subjects of the impending inquiry, after a glance at which the coroner returned to the inquest-room.

The importance of being able throughly to identify the features of the dead is of the last consequence. It will be remembered that in the Sadleir case, the very fact of the death was disputed, and it was asserted that the body found on Hampstead Heath was not that of the delinquent M.P. Indeed, to this moment it is believed by the Irish that he is still alive. Fortunately the late Mr. Wakley was able to put the matter beyond dispute, as he knew the deceased, and recognized him when the inquest was held.

Conditions, however, are always arising under which it is exceedingly difficult to identify a body,

in consequence of the progress which decomposition has made. Such a case has just arisen. It will be remembered that a body was found floating in the Thames, which the police suggested might be the body of the supposed murderer of the poor girl who was stabbed in George Street. It was of great consequence, therefore, that the corpse should be identified. The features, however, from long immersion in the water, were so swollen and disfigured as to be absolutely unrecognizable.

At this juncture, however, Dr. Richardson suggested that science was able to restore the face of the corpse; and he succeeded in his efforts. Having reduced the face to its original size by the action of a principle known by the scientific terms of "exosmosis" and "endosmosis," and its blackened colour having been bleached by the action of chlorine gas, so much of the face of the dead was made out as to prove that it belonged to a youth of twenty—a fact quite sufficient to prove it was not that of the murderer. Thus science once more has come to the aid of justice. But I must return to the story of my day's doings.

The jury having assembled, the process of swearing them in commenced. It may be as well to observe that, in ordinary cases, the run of the jurors called by the coroner's beadle seem to consist of the small householders and shopkeepers of the parish—certainly a very [illegible] lot to investigate any knotty case; indeed, my experience gathered during the day was, that the chief labour of investigating the facts falls upon the coroner, and that scarcely one of

the jurors sworn in seemed capable of drawing up a verdict. In important cases the better class tradesmen or the gentry are generally summoned, and a far higher amount of intelligence is thus at the service of the coroner.

The first case gone into was rather complex. Alexander ——, a greengrocer, coming home drunk, fell down the stairs and broke his leg. He had been an habitual drunkard, so much so as to compel his wife, a poor crushed creature, to live apart from him, because "he was too poor to keep me," said the poor woman, crying. "I suppose, if the truth were known," said the coroner, "it was because he beat and otherwise ill-used you,"—a correction of her own statement to which she gave a tacit consent, but which the poor battered piece of humanity, bundled up in rags, would never have volunteered. The ultimate cause of death in this case was singular. The man being a toper, the shock of the accident, a fracture of the femur, brought on delirium tremens: to subdue this, opium was given by the hospital surgeon by what is termed subcutaneous incision; that is, a puncture was made in the skin, and a small quantity of the drug was injected beneath it, from the effects of which he died narcotized. A diseased kidney perhaps helped this unlooked-for termination of the case, but it nevertheless was an extraordinary example of peculiar idiosyncrasy in the man's constitution, which could not stand an opiate which would scarcely have injured a healthy child. The primary cause of the death, be it remembered, was drunkenness.

Case No. 2 was that of Henry ——, a carman. Having been drinking freely, he managed, whilst walking beside his horse, to get his foot under the animal's hoof; he was thrown, and the wheel of his car passing over his ribs fractured them, and he died from inflammation of the lungs. The verdict here was inflammation of the lungs brought on by an accident whilst in a state of intoxication.

Case No. 3 was that of William ——, a tailor. In reeling out of the doorway of the Red Lion, where he had been drinking, he slipped, and twisted and broke his leg. A "compound comminuted fracture of the tibia and fibula," said the youthful house-surgeon, with strict professional accuracy. Amputation was performed, and the man died of delirium tremens. A verdict was drawn up to that effect, and the poor widow, bursting out into tears, sobbed out that she was left perfectly destitute. When death comes to members of the comfortable classes it is bitter enough; —to lose a loved husband, what in the whole world is apparently so overwhelming? Yet what is such a blow to that which falls upon the poor? A working man by some accident is hurried out of life, and the poor widow loses not only the companion of her life, but the bread of herself and helpless little ones. The reader will realize the horrible position of the poor widow; and yet the coroner sees such cases every day, and the poor creatures are left to sink back into that maelström of human suffering styled "the world," and the sun shines day by day as though life was a bright festival.

St. Mary's Hospital, Paddington, was our next destination. The hospitals generally furnish those cases for inquest which result from accidental death. In many institutions of this nature an inquest-room is provided in the building itself, but the authorities of St. Mary's have not done so; and after visiting the dead-house, and inspecting the deceased, a woman and a boy, both evidently Irish by their physiognomy, the coroner and his beadle adjourned to a public-house, where a fresh jury had to be sworn in. After contemplating the face of the dead, it gives the mind a slight shock to have to wend one's way through the crowd of a tap-room, and to have to sit in an apartment smelling of stale tobacco, and presenting all the disorder of the last night's debauch. "We shall probably have some trouble here," said the coroner to me, *sotto voce*, "as I see the witnesses are mostly Irish." The deceased, Anne Gardner, was a charwoman, and had died in the hospital from exhaustion following an amputation of the foot. The first witness called was her sister, a gaunt Irishwoman with a face through which the skull seemed to protrude, if we may so speak. The poor woman kept up a crooning noise until called upon to give her evidence as to the cause of accident, which was confused enough to justify the coroner's anticipations. In answer to the query, if the deceased had told her when in the hospital how the accident happened, she replied, "Her sister had told her that she 'knocked at the door and it was not opened,'"— that "the blood was all up the stairs, just as though a bullock had been killed."

The woman knew no more than this, and she kept repeating her tale as though she were throwing valuable light on the matter. The next witness, a short, red-faced, and determined looking Englishwoman, told her story in a very different manner. She had gone out on Saturday night to buy provisions for the family, leaving deceased, who lodged with her, at home; the deceased having apprised her that she also was going out to get a bottle of gin. When she returned at twelve o'clock at night, having forgotten her key, she was obliged to ring her husband up, and on opening the door he remarked that the stairs were very wet; on getting a light she perceived that they were wet—but with blood, which was traced up to the woman's room. On knocking, the deceased answered that she knew all about it, and would clean it up before her landlord was down in the morning. With this reply, singularly enough, the woman was satisfied, and went to bed. Having some misgivings, however, she demanded admittance to the room early in the morning, and the woman, apparently, from the sound, shuffled to the door on her hands and knees, and opened it. "There was not a thing in the room," said the witness, "but that was covered with blood." The bones of her leg, near the ankle-joint, were broken, and through the night she had been bleeding most profusely. As the poor creature was too exhausted by the hæmorrhage to give an account of the accident she had met with, it could only be inferred from the appearances in the house. The door not being opened to her, and fearing to let her landlord know that she

was out so late, and, but too probably, being drunk at the same time, she had attempted to step from the doorway across a low parapet wall on to the parlour window-sill, a stride of four feet and a half; in doing so, she fell into the area, for the blood was first observable at the kitchen door, through which she obtained admission.

From this point traces of blood were observable up the kitchen stairs to the front door, which, it is inferred, she opened, to take in the gin-bottle and a small basket which she had deposited there previously to attempting to get in at the window; from thence the life-blood of the poor creature doubled back through the passage, and was traceable up to her bed-room. It is not to be wondered at that the poor woman never rallied from the operation of amputating her foot, as, indeed, nearly every drop of blood was previously drained from her body.

Since it was pretty evident that the poor creature never would have made an attempt to enter the house in the manner she did unless she had been intoxicated, and as, moreover, her landlady was obliged to confess that she was given to drink, the coroner suggested to the foreman of the jury that they should state in their verdict that the accident was the result of her intoxicated condition at the time; but the jury refused to accede to his wish; and he afterwards informed me, that when he held inquests at public-houses, he always found a disinclination on the part of the jury to notice the fact of intoxication playing any part in the death, even when the fact was but too evident!

Having no teetotal tendencies, and believing that to take a pledge of total abstinence from alcohol is simply a piece of puritanical absurdity, which, if carried out in all cases where temptation presents itself, would result in an abnegation of the will itself, I nevertheless could not help being struck with the astounding fact, that in the first four inquests held promiscuously in one day, every case of death was clearly caused, either directly or indirectly, by the vice of intoxication.

Mr. Gough might have lectured upon the subject for years, yet I will venture to say that he never would have made such an impression on me as did the faces of those four poor creatures, staring up at me from their coffins—not emaciated by disease and long-suffering, but perishing in the prime of life, and leaving behind them long trains of suffering children and helpless widows. There are many sayings that we use glibly enough, and none among them further from the truth than one we often hear—"Providence takes charge of drunkards and little children."

The next case was that of a little Irish boy who had been killed by a cab running over him. The lad had been following an Irish funeral,—one of those noisy, demonstrative affairs which are pretty sure to gather up all the loose Milesian element that lies in the line of procession. The lad was riding behind one of the mourning cabs, and falling off, the next cab in the line ran over him.

The cab—according to the only intelligible witness who saw the accident take place—was loaded with six

persons inside and six on the roof; it was not wonderful that the wheel passing over his body ruptured the liver, and killed him within two hours. He was the last of three children whom his mother, a poor widow, mourned.

The duties of a metropolitan coroner extend over a very wide district; from Paddington, accordingly, we had to hurry away to Islington, where a new beadle was awaiting his superior, with a fresh jury ready to be sworn in. Coroners' beadles are characters in their way, and they have all their peculiarities in getting up their cases; but they all agree in one particular—a desire to make as much of each inquest as possible, not from any pecuniary advantage derivable therefrom, as they are paid only 7*s.* 6*d.* for each case, but simply for parade sake. Thus they invariably put forward their weakest witnesses first, and in this manner often waste the time of the court in parading testimony of no importance whatever, whilst the only material witness is kept until the last. Unless the coroner is up to this little weakness, his time is often taken up in a very unnecessary manner.

The three following inquests were on children, two of whom were illegitimate. The first, Ernest H——, an infant of two years old, "out quite beautiful with measles," as his mother said, was seized with a fit, in which it died. As no medical man was present, and no medical certificate of cause of death could be given, the registrar refused a burial order, and hence the inquest. Coroners in the metropolitan district are more than usually critical in cases of illegitimate

children, in consequence of the fearful amount of infanticide prevalent in such cases.

I remember the late coroner giving it as his opinion that a fearful amount of children were cunningly got rid of at the moment of birth, by simply allowing the new-born babe to fall into a tub of water. The medical test of a child having been born alive is the inflation of the lungs; where this has not taken place, it is held to have been stillborn, a fact taken advantage of by some mothers in the way we have mentioned.

In the case of this poor child, however, there appeared to have been no foul play. In a second case, a child of two years of age—"a little come by chance," as one of the witnesses phrased it—was allowed to run out into the road uncared-for; and, a cart coming by, ran over and killed it. The verdict might, with justice, have been "Went by chance," for the little care that was taken of it.

Still another child called for the verdict of the twelve good men and true. It was a sad sight to see the little face, placid as though it slept, in its mimic coffin of blue, and still sadder to hear the young mother's agonized recital of its death. It was alive and in her arms at three o'clock in the morning, when she gave it the breast; then she went to sleep with the child "on her arm." When she awoke she kissed it, "as was her custom," when she found it was cold. The child evidently had been either overlaid, or smothered with the bed-clothes.

Scarcely a week elapsed, the coroner informed me,

without his having to hold an inquest on a poor infant, put out of life, in some cases perhaps purposely, but in the great majority of instances by over-fondness of the mother in covering the little one's face up for warmth sake. The majority of women treat their tender little ones just as if they were so many hot rolls, smothering them in blankets, forgetting that the breath of life in their fragile frames is but too easily extinguished, and that they have not the power to struggle as older children would against the covering that is poisoning them with their own foul breath.

Our hard day's work terminated with the case of an old sailor, who, after braving all the terrors of the ocean, came off a long voyage to die of diseased heart in his own bed. The body lay in a small dark room, next to the common living-room, and the stench of decomposition was so great that the jury started back in dismay when the door was opened for the purpose of his being identified. The practice adopted in this country, and in this country only, we believe, of allowing the dead to remain in the very apartments of the living, is certainly most revolting; and we hope the time is not far distant when the public will seek for the establishment of perfectly ventilated reception-rooms for the dead, previous to interment. Those who have witnessed the arrangements in Munich, Frankfort, and other places abroad, for separating the lifeless clay from the living for the short time previous to burial, must see how we are sinning against the commonest hygienic rules, as well as against decency itself, in tolerating our national habit of hugging the

dead until we are compelled to relinquish them by their very offensiveness.

Walking home, I wondered how the coroner lived, moved, and had his being without being terrified lest at every turn some little unforeseen occurrence might bring a brother coroner to sit upon him. Having seen how lightly accidents occurred, it was days before I could get the thought out of my mind, that we are continually within an ace of our life.

In all probability, however, the coroner is the last person in existence to feel these foolish fancies, as death in his experience comes from so many and from such conflicting causes, that the one balances the other, and thus keeps his fears in a happy equilibrium.

We are not all coroners, however, and I must confess that for days afterwards I looked much shyer at a crowded crossing than was my wont, and took especial good care to walk outside of ladders.

If, however, accidents take place according to a regular law, and we all go out in the morning with a hundred-thousandth chance of breaking our legs, a five hundred-thousandth chance of being drowned, or say a sixty-thousandth expectation of stepping upon a piece of orange-peel and fracturing our skull, we may at least be less nervous about these matters, for, do what we will, the statistician, in estimating the number of annual accidents and offences, claims a certain right in us which we cannot avoid or dispute.

VIVISECTION.

THE Society for the Prevention of Cruelty to Animals has been of late greatly perturbed with respect to the vivisections practised on horses in the veterinary schools of France. This is no matter for surprise, as the public generally have been moved with disgust by the recitals given in the public papers some time since of the experiments performed upon living horses in the veterinary colleges of France for the sake of affording instruction to the pupils. No doubt the society was quite right in the representations it made to the Emperor upon the subject, and we are glad to see that its remonstrances are likely to lead to the suppression of the unnecessary cruelty inflicted for instruction sake across the water.

Not content with this success, however, it has commenced a crusade against the performance of vivisection in any form, and its members class any operation which may lead to the most important results in surgery calculated to relieve human suffering in the same category as the maltreatment of a donkey.

It is extraordinary what absurd speeches excited philanthropists will make when they meet together,

and mutually alarm each other by exaggerated statements.

We have now before us the Report of the International Congress held by this society at the Crystal Palace last August, and more audacious misstatements of fact than are contained in that Report we certainly never read. Really it would appear from them that surgeons in this country are a set of demons who take delight in cutting up living creatures without aim or purpose.

The value of vivisections is utterly denied, and a reverend prebendary gravely affirms that the living body can give no response to the interrogatories of the scientific surgeon which cannot as easily be gathered from the dead subject!

Another gentleman asserts that no discovery of any moment has arisen from the practice of vivisection, and there was an almost unanimous chorus in favour of putting down the practice of "torturing living animals," except in certain special cases and under certain conditions, of which we presume a committee of the society would wish to elect itself the judge.

Imagine John Hunter having to pause in the pursuit of some subtle investigation into the ways of life, in order to ask permission of a conclave of old ladies of both sexes that he might try an experiment upon a mouse!

We think it would be well if the members of the Congress, before denouncing the practice of vivisection in the terms they did, had taken the trouble to inquire respecting the frequency and manner in which it is

performed in England. To listen to the excited speakers, one would think that it was the custom of surgical professors to "cut up alive" animals in the class-room for the edification of the students. Now, it is scarcely necessary for us to state that vivisections are never performed in the dissecting-room or theatre. Certainly, during the five years of our acquaintance with one of the largest hospitals in London, not one experiment of any kind was performed on a living animal. Vivisection, when it is performed, is done by the physiologist in his own study. The tortures endured by the animal whilst under the process of "dissection" exist only in the imagination of the speakers.

Common sense should have told them, that whilst we have such a thing as chloroform, an operator would not be likely to pursue his investigations amid the frantic struggles of an agonized animal. As for the "cutting and carving," and the "dissection," said to be carried on without a definite purpose, it is a simple calumny. The division of a nerve, the tying of an artery, the section of a muscle, in the vast majority of cases, are all the operations required for the elucidation of the problem of life the physiologist may be seeking to solve. Any surgeon who should aimlessly mutilate any living creature would instantly lose caste among his brethren, who, we would beg to remind the members of this society, are not Feejee Islanders or subjects of the King of Dahomey, but educated English gentlemen.

We really scarcely know how to deal with the extraordinary statement that vivisection can teach nothing

that may not be equally well learned from the dead body. If life and death are the same thing in the minds of these gentlemen, there can indeed be little use in attempting any argument with them. Equally absurd is the idea evidently in the minds of many of the speakers, that we should wait for the accidents that are always occurring to the human frame to elucidate the many problems that yet remain to be solved in physiology. We are afraid if we waited for the exact accident required to suit the exact case demanding a solution, that the science of life would make but tardy progress.

In answer to the assertion that no good has ever come of vivisection, it will be sufficient to say that it was the knowledge thereby gained by John Hunter that made him the profound surgeon and physiologist he was. Had he been influenced by the squeamish doctrine set forth by this society, the great reforms in the art of surgery which date from the time of his teaching and writing would not yet, in all probability, have been accomplished. The vast service he performed for humanity in discovering the means of obliterating aneurisms in the human frame would alone be sufficient to confute those who deny the value of vivisection; and in our opinion the destruction of a whole hecatomb of dogs would not weigh in the balance against the value of that great discovery.

But it is in the study of the nervous system that the use of vivisection has been so clearly shown. It may be said without the slightest hesitation that we should have been as ignorant of the true mode of action of

that system as were the ancients, had it not been for the labours of Bell and Marshall Hall, both of whom gained all the knowledge with which they have lit up that hitherto dark subject out of the bodies of living animals.

Dr. Marshall Hall used to say that the frog was "God's gift to the physiologist," and there can be no doubt that unless the highly-organized nervous system of the frog had been made subservient to the uses of man by these philosophers, Medicine would have altogether lacked the mighty impulse they have given to its teaching.

Dr. Brown-Séquard again is worthily following in their footsteps, and by the legitimate use of animal life is clearing up the difficulties they have left unravelled. To deny the rabbit, or the frog, or the dog, to such men as these, would be equivalent to denying the violin to a Paganini, or the brush to a Maclise, or the pen to a Carlyle; it is the tool with which they work, and without which their subtle intellect would have been given to them in vain. To confound labours such as theirs with the snug conceit of the paid lecturer, who bids a gaping crowd watch the agonies of an expiring mouse under the exhausted receiver of an air-pump, is, in our opinion, simple impertinence. There is the cruel process of crimping cod and salmon —"that is vivisection," cried Dr. Tunstall, of Bath. Just so, and a very cruel process it is, and we think the benevolent Doctor would be quite justified in getting up an "Anti-Crimping-Salmon Society;" nay, he would be equally justified in directing the energies

of sympathizing friends against the skinning of eels; but, in the name of common sense, we must protest against the lumping of acts such as these with the scientific and definite interrogations put to Nature by trained philosophers—by means of vivisection.

Surely the Society for the Prevention of Cruelty to Animals has not so far exhausted all the fields of labour open to it as to justify its making this senseless crusade against the means of furthering the aims of science.

To rush to the rescue of a frog lying senseless and painless in the hands of a physiologist, whilst we shut our eyes to the rush of man and horse and dog after the poor hare or fox, is certainly to strain at a gnat and swallow a camel. We would put it to these worthy humanitarians, whether it would not be better for them to adjourn their onslaught on scientific men until they have rescued poor puss from the helterskelter rush that is made upon him by the country gentlemen for no more noble aim than mere amusement?

Looking at the matter from our own point of view, of course, we do not mean to condemn this pastime, which subserves to the health of those who enjoy it; but from the extreme point of view taken up by this Society, the pastime of hunting must be cruel in the extreme.

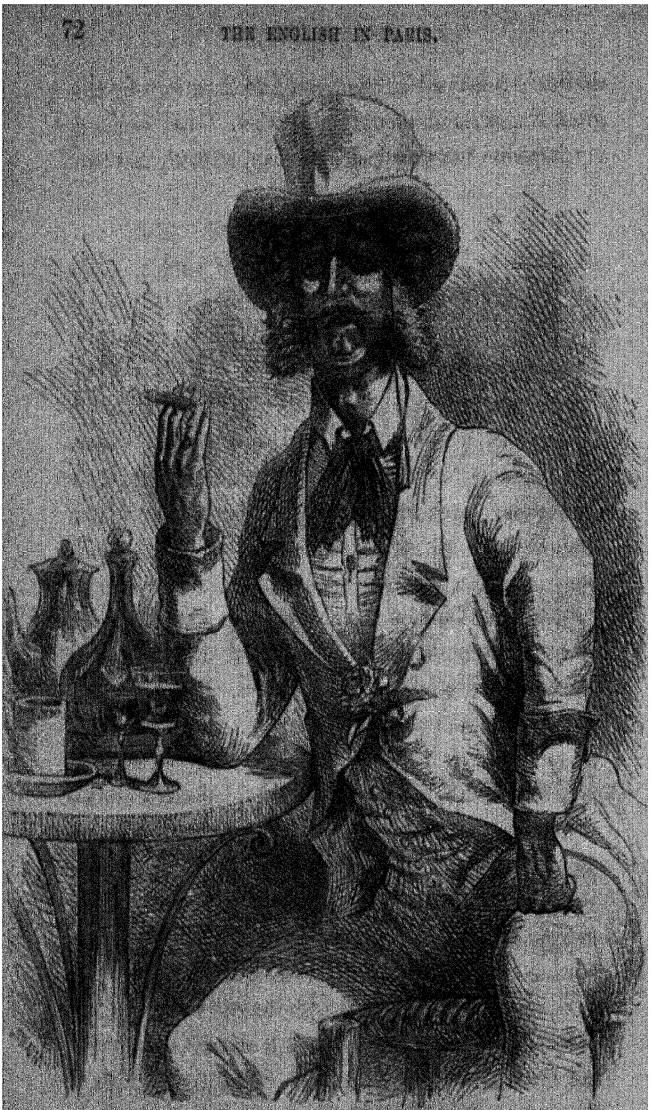
Here then is a fair field for the labours of the Society. Let it strive to put down the pastime of the country gentlemen; then it will be time enough to interfere with the scientific labours of our philosophers.

THE ENGLISH IN PARIS.

A GENTLEMAN, under the signature of "G. U.," wrote last season to the *Times*, complaining in the most indignant terms of the slovenly manner in which our countrymen and countrywomen dress immediately they put the straits between them and home. He sees and, according to his own account, shirks his best friends because they appear in the streets of Paris in the costumes of cab-drivers. The ladies are offenders of a deeper dye; they mount battered round hats, and save up their old dresses for the sake of appearing perfect drabs in the polite city of Paris.

Our proud G. U., who we should surmise to be one of those resident Britons who have become more French than the Parisians, is deeply hurt at our bad habits, and is evidently very much ashamed of his touring fellow-countrymen, and dreadfully afraid of what the satirical Parisians will think of them.

Having myself returned from a month's holiday on the Continent, a week of which was spent in Paris, I was not a little astonished at the frightful pelting which I, in common with the rabble rout of Englishmen, have received at the hands of G. U. Having a



Un Anglais à Mabille.

desire for a few weeks climbing, I took pattern by the great Napier, and thought that when I had reduced my impedimenta to a piece of soap, a towel, and two



An Englishman and his Belongings, from the Meridian of Paris.

flannel shirts, I had done a clever thing. In this light marching order I had the audacity to return home by way of Paris; had I had the honour of

G. U.'s acquaintanceship, possibly I might have been received by courteous cut direct; but as I only know an inferior sort of people, who don't judge friends by their clothes, I happily escaped that infliction.

I must candidly confess that my own impressions of my fellow-countrymen abroad did not by any means tally with those of G. U., who is so very sensitive for the honour of his fellow-subjects. When I strolled up the Champs Elysées, if amid the crowd of natives in lacquered boots, dress coats, and the other etcetera appertaining to the full mufti in which Parisians will appear abroad before dinner, if, I say, I observed a particularly manly-looking fellow in a light lounging-coat and lace-up boots, I was pretty sure to find, on looking into his honest face, that he was a young Englishman. If a brighter young Hebe than usual passed by, in "maiden meditation fancy free," it was sure to be a dear young English girl.

Amid the arid faces of the Parisian fair, to my eye the bright cheek of our English rose was as the waters of some oasis to the traveller after the dreary desert. They might have had round hats, but what of that? I am quite sure they were not "battered," and also certain that they crowned the face with more grace than the best bonnet of Paris would have done.

It is pretty well conceded that the young Englishman is the best-dressed man in the world (a fact which G. U. evidently does not know); but I mean to assert, what will doubtless be contested, that the English gentlewoman carries the palm for the ease and simple elegance of her attire. The grace of the

human frame is less disguised in her by the milliner; you see more of the woman and less of the mode. Possibly there may be a reason for this in the finer condition of the raw material, if we may be allowed such a phrase when speaking of the gentler sex. We know that cooking has arrived at such perfection in France as only to disguise the badness of the meat.

But letting this pass, and returning again to the sensitive feelings of G. U., let us see what evidence he has to give of the sneers of the Parisians at our slovenly appearance in their fair city. He tells us that we are caricatured in every printseller's window, and that the Palais Royal is full of plaster statuettes which jeer us as we pass. We may remark *en passant*, that, in the caricature line at least, the Parisians—the acute, sarcastic Parisians—are the dullest dogs in Europe.

If an actor, taking the *rôle* of a Frenchman at the lowest theatre in London, were to talk of eating frogs, he would be hissed off the stage for the staleness of his joke; but in the best Parisian theatres the Englishman is still represented in top-boots and belcher-handkerchief, either beating his wife, or exhibiting her for sale in the market-place with a rope round her neck. This is considered capital fun in Paris to this day, and is sure to bring the house down. When *Punch* touches up the Frenchman, or when Wigan brings him on the boards, they hit him, we fancy, a little harder. But let us see what their caricaturists can do. G. U. tells us that our slovenly outlandish dressing is the constant theme of their pencil.

At the beginning of this chapter is the gentleman who holds the mirror up to Nature, and shows us just as we appear in that delightful spot, the Jardin Mabille.

At a glance the reader perceives there is not much of the cabman about him; on the contrary, in his dress at least, there is somewhat of the *petit-maître*. But where, by all that is gracious, did our English man get that hat? Could he obtain it at any price here? Did Lincoln and Bennett or Christy ever see such a specimen? That necktie, again. Come, now, G. U., confess that cabmen do not do the thing in that style. And the coat, waistcoat, and flower—why Jimmy Jessimy never turned out in brighter trim.

If this is the Frenchman's typical Englishman, he certainly is far removed from the "cabman" of G. U. The only ghost of a joke as far as we can see, is the delightful mixture that "Un Anglais" is indulging in—coffee, claret, and rum-and-water (by the lemon floating in it)—warranted, we should say, to take the bloom from his cheeks next morning. Is it a fact, we may ask, that the Adam's apple in the Englishman's throat is more *prononcé* than in other people's, or is the exaggeration of the picture another of our Parisian friend's brilliant jokes?

But what have our friends across the water to say to the English Ladies? This is the reply, in the shape of one of the innumerable clay statuettes, which abound in the shops of the Palais Royal, and a specimen of which will be found on a previous page. Of

course, our critics don't neglect to hang the ladies on the arm of their conductor, like two panniers.

We know in good society this is voted dreadfully provincial, and we don't think well-bred people are guilty of such a solecism; nevertheless, the custom has its charm, the cavalier is nearer to his work, and no advantage of position is given to either fair. Moreover it is a very pretty position to find yourself, as it were, the battle ground across which the nimble fire of feminine tongues is exchanged. But let that pass; we will plead guilty to the possibility of Paris being shocked by this kind of coupling; but are these the round battered hats of our censor? Are these the slovenly English? The man is evidently a prig got up at a great expense by Mr. Moses; but he certainly runs into the opposite extreme to cabbyism. Of course, the Parisians must poke their fun at the English coiffure. In the majority of the statuettes, the English lady wears the hair in single ringlets down to the waist,—the French face can't stand the hair thus dressed; moreover, the French hair won't curl so kindly as ours; hence the sneer;—but here we have the very agony of dishevelled locks, and the very Quakerism of braids, not very true as to the ladies' coiffures, but yet not quite an absurd caricature.

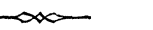
But those waists, and those ridiculous polka jackets, falling over those crinolineless skirts! Are they a libel or not, fair reader, on English ladies' costume abroad? If I can believe my own eyes, they don't dress so in the ball-room-village of Interlachen, at

Spa, or Baden-Baden. We never met any of them on the boulevards in Paris; and even if we had, they do not carry out G. U.'s atrocious libel upon fair Englishwomen's costumes abroad, that it is slovenly and slipshod.

An idea strikes us. We know that in France and other continental countries, luggage is always paid for box by box. We have seen Paterfamilias standing aghast at the pile of trunks he has to see weighed in foreign railway stations. We know this forms a very important source of revenue of their railway companies; is G. U., we ask in all good faith, bribed by them to pile up this mountain of impedimenta still higher, and does he do his work accordingly by abusing, in the *Times*, his fair countrywomen for their shabbiness?

If I know anything of my fair countrywomen, I think I am not far out in believing that their instincts to make themselves as taking as possible are not likely to be dulled by a visit to Paris; and of this I am certain, the English gentlemen who dress like cabmen, are confined to the personal friends of the fine gentleman who signs himself G. U. in the *Times*.

THE NEW HOTEL SYSTEM.



When railways were first brought into operation, and one by one the splendidly-appointed mails that used to leave the Post-office yard at St. Martin's-le-Grand dropped out of life, and found their way to coach-makers' backyards, what a revolution was inaugurated in our social habits! Any great invention affecting our social arrangements is sure to carry in its wake other changes scarcely less important. But the first puff of the locomotive, as it sped on its way to Manchester—what a shock it proved to old ways and habits of thought!

In conservative England, however, although the current of change may be moving rapidly in any given direction, it is very remarkable how long old forms and habits will remain to all appearance unchanged by the revolutionizing agent. Progress goes on like the white ant in India, eating out the heart of the thing it attacks, until the outside is hollowed to a shell, which the slightest touch reduces to dust. Let us instance our old Hotel system.

What ages seem to separate us from the days when the travelling world used to put up at the Bell

Savage, the Saracen's Head, the Swan with Two Necks, the Black Bull, or the Bell in Holborn! The type of all these famous old inns was pretty much the same—a great court-yard into which the coach rolled with its heavy load, and a quadrangle surrounded with wooden galleries and balconies by means of which the guests found their way to the different bed-rooms, a low bar, a stuffy coffee-room, and a much superior commercial "parlour."

The model was that of the Tabard of Southwark, in which the genius of Chaucer assembled his Canterbury Pilgrims in 1383. Such were the renowned inns of London to which middle-class travellers resorted not more than five-and-twenty years ago. These were the only genuine old hotels in existence.

'Tis true that a sort of mongrel inn, constructed out of three or four old houses, with floors on different levels, and with partitions cobbled up to suit the exigencies of the moment, was from time to time called into existence; but, with the exception of the houses mentioned, there were no other hostels specially built to suit the requirements of the travelling public.

In these inns such things as carpets were not known in the public rooms thirty or forty years ago, and we can all remember the funereal four-posters in the bed-rooms, the old thread-bare carpets, the musty old corner washstand, with the cast-iron soap, which had passed through the hands of countless travellers without even raising the ghost of a lather.

Such was the accommodation Paterfamilias was obliged to put up with on coming to London a quarter

of a century ago; nay, in many cases, as late as ten years back; and for charges such as should have commanded all the comforts of home. It is true there were, and still are, certain hotels which sought a particular custom, in which a traveller could be comfortable enough.

For instance, Furnival's Inn, in Holborn, is still the great home for country clergymen and other professional gentlemen who love a good glass of port. The Castle and Falcon is sought by Manchester merchants and other commercial "gents," and the Spread Eagle, in Gracechurch Street, is still famous as a resort for seafaring men. At the West-end, again, the family hotels are "little heavens below" for those who can command the purse of Fortunatus; and the Clarendon, in Bond Street, is a kind of noble preserve in which all the old and noble families engage suites of apartments for the term of their natural lives paying for them every season, whether they are used or not, whilst its younger sons hold out at Long's. And last, but not least, there is Mivart's, in which they receive nothing lower than crowned heads and princes of the blood royal.

Notwithstanding the controversy carried on in the *Times*, in which the shortcomings of London hotels were so clearly pointed out, and notwithstanding the splendid hotels which have long flourished in the United States, it seemed as though matters would never mend, and that we were condemned to old buggy four-posters for ever. The hotel proprietor was an Old Man of the Sea, and seemed destined to

ride to the end on the shoulders of the British public. Yet the whole system was hollow.

The Great Western Railway Company, about a dozen years ago, built the Great Western Hotel; five or six gentlemen formed themselves into a company to work it, perchance in fear and trembling, and from the moment its doors were opened to its guests its success has been triumphant. The pressing public want of the age had been discovered, and unheard-of dividends were the result. Since that time a perfect mania for gigantic hotels seems to have taken possession of European capitalists. The Louvre and the Hôtel Grand in Paris have become famous throughout Europe, and in London every large terminus has its mammoth hotel; and the cry is still they come.

No greater contrast can be conceived than that between the old-fashioned London hotel built and added to by succeeding generations, and the splendid palaces constructed after some Palladian design, which we now see towering like huge elephants over the surrounding houses. These establishments have leapt into life, fully armed, like Minerva from the brain of Jupiter. They differ as much from the hotels of our forefathers as a railway-carriage differs from a stage-waggon. The traveller of the present day, in short, enjoys in this metropolis a first-class club life at third-class club prices.

As the Grosvenor is one of the latest and largest of these new railway-terminus hotels, we will accompany the reader through its long galleries and splendid reception-rooms, and give him a general view of the under-

ground offices in which the main business of the hotel is carried on.

There is a very popular print which represents a longitudinal section of a first-rate man-of-war, and which at one glance shows the spectator the whole economy and anatomy of a great war-ship of the old school. If we could make a transverse section of the Grosvenor, it would be equally interesting, and, moreover, it would represent a thing of the advanced present, instead of, as in the case of the 120-gun ship, only a picture of the past.

No object in the metropolis strikes the provincial Englishman with more astonishment than the first sight of this huge building. From the dip of Piccadilly he sees it looming in the distance, far over the head of the royal palace; as he gets nearer it seems to grow into the air; and as he *debouches* full upon it from some side-street, it towers up like a mountain before him—a mountain chiselled from basement to garret with clustered fruit and flowers, all wrought in enduring stone.

A fastidious taste may perhaps think the building somewhat overdressed, but there can be no dispute about the enormous amount of labour spent in its enrichment, or respecting the imposing appearance of the pile, with its "stories without end" which the giddy head refuses to count. The richness of its exterior far surpasses the Louvre Hotel, from which it totally differs as regards construction.

From the open nature of its site it is lit almost wholly from without, whilst the model Parisian hotel,

jammed in between tall houses, was constrained to adopt the interior-court system, which, together with some advantages, on the whole contrasts unfavourably with the design of our great metropolitan hotel.

The disadvantages are patent the first moment we enter the doors of the Grosvenor. Although we enter a noble hall, from which marble flights of stairs ascend with almost regal dignity and amplitude, yet we must confess that we miss the exquisite grace which greets the stranger as he drives into the crystal courtyard of the Louvre. We miss the tropical verdure and the trophies of flowers which adorn the grand court, the Oriental palms on the balustraded stairs through which fair faces gleam and bright eyes glisten from the open windows of the gilded saloon as the bell announces the arrival of strangers. By night, again, we miss the bright *café*, the brilliantly illuminated offices, and the fringe of guests smoking and clareting, and clattering *petits verres*, whilst ladies take ices and demurely quiz; we miss, also, the *salle-à-manger*, which rivals the finest rooms of the Louvre palace in gilding, in rich mouldings, and in its painted ceilings. But in all the true substantialities of an hotel, in the comfort of its arrangements, in the light of its apartments, and in its cooking, and last, but not least, in its moderate charges, the Grosvenor may challenge comparison with its Parisian rival.

When we speak of rivalling, however, we only refer to management and arrangements, as no London hotel yet constructed can bear comparison either with the Hôtel Grand or Louvre in magnitude. For instance,

the Grosvenor makes up only 180 beds, whilst the Louvre can accommodate 500 guests, and its sister hotel an equal number, we believe. Whilst, however, Paris can sustain only two of these gigantic caravanserais, London will, in a short time, possess at least a dozen of the more moderate-sized railway hotels, of which we take the Grosvenor as a type.

But let us enter, as we have tarried long enough on the threshold. If you wish, good traveller, to spend but moderately, and you are therefore told that you must mount to the third flight, your mind and your legs also will be relieved at being invited to enter the ascending-room.

At the Louvre you sigh as you see your heavy luggage taken up by the "lift," and wonder why humanity should be treated worse than trunks and portmanteaus. But "they manage these things better" at the Grosvenor—at least as far as the traveller is concerned, for he steps into a room, throws himself on a lounging sofa, and, lo! he is in a trice on the third floor. Meanwhile, the porter is constrained to carry his own load and that of the traveller up the long and wearisome flights of stairs,—an error this, but one which the traveller will at least contrast favourably with the arrangements of his Parisian hosts.

When we consider the waste of human muscles that a few gallons of water scientifically applied can save, we wonder that these convenient ascending-rooms were not in public use long ago. One hundred and twenty gallons of water is sufficient to work the

hydraulic apparatus by which the room, with its complement of seven inmates, can be lifted, say 120 feet, which, at fivepence a thousand gallons, makes the cost a little more than a halfpenny.

But here we are on the third floor, and as the room stops level with the landing, the head chambermaid, who has been spoken with through the gutta-percha tube from the bar below — or "bureau de reception," as our Parisian friends have it—meets us and conducts us to the apartment assigned to us. As in the Parisian hotels, there is a service to which is attached a head chambermaid and two subordinates, neatly dressed in black stuff with white aprons.

The "service" here is not the gossiping, lounging room of the Louvre, in which the male attendant receives the keys, and dispenses bad cigars to the little company on his particular *étage*. We know the obvious limits of service which Nature draws between men and women. Men do not make the beds, and women do not act as porters. The room of the head chambermaid is used simply as a station to receive orders and to take the keys of the guests.

One is astonished abroad to find the keys of every guest hanging in the hall of the hotel on a black board opposite the number of his bedroom; and one is more astonished to find that the clumsy, ill-wrought keys are all alike, and that it is the easiest thing possible either to take your neighbour's key when he is out—and you may be certain he is out by the fact of his key being on the peg,—or else to use your own key to enter any apartment whose lock it will fit.

When the Grosvenor was opened the foreign system was adopted, in so far as hanging the keys openly in the "service," and the result was that different rooms were entered and robbed, by the facilities thus given, to the extent of £500. If this had gone on it would have ruined the hotel. Mr. Hobbs was therefore called in, the doors were altered so as to open from the inside only by the handle, and from the outside by the patent key; consequently, if a guest should leave his key on the mantelpiece, and slam the door behind him, the master-key of the manager would be his only means of obtaining ingress. If he took his key he would leave it at the service, not open, as abroad, but in a frame specially fitted up to receive it, and fastened with a patent lock, the key of which is retained in the possession of the head chambermaid. By this arrangement surreptitious entry into any guest's room is impossible, and since its adoption robberies have altogether ceased.

It is unnecessary to describe the bedrooms, all of which are lofty. We may go so far as to say they differ as widely from the old bedroom of the British hotel as these did from the sleeping-room of a well-ordered private house of the best class. In addition to the usual conveniences, 120 of the sleeping-rooms have private *closets*. Those only who have experienced the indescribable odour of those apartments in the immediate vicinity of the said *closets*, in the very best hotels in Paris, will be able to appreciate the merit of this arrangement.

There are private suites of rooms on the different

floors for families; and as no great hotel should be without its facilities for wedding-breakfasts, the Grosvenor boasts a resplendent range of chambers fitted for the especial service of Hymen.

The ground floor is devoted wholly to the public rooms; the dining-room is perhaps one of the most cheerful apartments in London. Unlike the dark *salle-à-manger* of the Louvre, which is lit by a borrowed light from the interior, its windows look out upon the stream of life for ever flowing to and from the Victoria Station. No attempt has been made to introduce the *table d'hôte* dinner, as it has been proved over and over again that it is not suited to the tastes of Englishmen. Your Briton has no objection to make one of the three or four hundred guests who quiz each other in foreign hotels, or even at English watering-places; but we decline to depart from our habits of reserve in our own great cities. If any person could have successfully established a *table d'hôte* dinner in London, Mr. Verey was the man; but he made the attempt, and failed, some years ago, and it has never been tried a second time, at least for the delectation of first-class Englishmen. Since the breaking up of the pew system, if we may so term the high boxes which of old partitioned guests from each other, isolated tables to hold four persons seem to be the fashion, and these at the dinner-hour are generally well filled with guests, attracted by the very good cooking and the admirable manner in which the table and dinner is served.

It is certainly an innovation in hotel charges to be

able to obtain a really good dinner of soup, fish, and joints, with vegetables, for four shillings, and a dinner from the joint, with vegetables, for three shillings.

The lift, which communicates with every sitting-room as high as the third story from the kitchen, distributes each meal all over the house "hot."

The smoking-room is a magnificent apartment, thoroughly ventilated. The ladies are taken care of as well as the men. They have a private room devoted exclusively to themselves and opening into the library, well stored with books and periodicals, which is appropriated to the guests resident in the house. It will be seen that this new style of hotel, of which the Grosvenor is the exemplar, is arranged more like the apartments in a private mansion than the ordinary inns we have been accustomed to, where the coffee-room, at best, contains a Post-office Directory, or perhaps a local guide-book—the newspaper always being engaged by "the gentleman upstairs."

But the chief points of interest in the hotel are to be sought in the basement. Here, in the spacious offices underground, the real agencies by which the great household above is provided for, lie hidden from the general eye. It is a small town we traverse, rather than mere domestic offices.

For instance, under the road, and opening into the spacious area, we notice the bakehouse. All those delicate rolls which furnish the dinner-table are made on the premises; and, as we pass, the white-capped baker is seen busy with his peel, getting ready the bread fresh and fresh for the day's meal. In the next

arch we see the fish-store—it is a veritable fishmonger's shop, bright with scarlet lobster, glistening with silver salmon, and tinted with the delicate hues of the red mullet, all ranged on the ice-cold slabs. In the next compartment is the ice-house, with its refrigerators, the grand conservatory of perishable delicacies in the dog-days. Some little distance off, water in its liquid condition is to be found. Boilers under the roadway circulate hot water over the entire house; within the distance of twenty yards we pass from the Tropics to the Pole, and witness the arrangements for dispensing either refreshing cold or life-restoring warmth to the population above.

In the basement of the establishment are to be found the usual offices, but so magnified in their dimensions as to be scarce recognizable. For instance, here is the den of "Boots;" but this renowned individual, like our Lord High Admiral, has been put in "commission," and his duties are now performed by a committee of six.

Then the washing-room is passed—a large apartment presided over by an active little lady who passes her entire life amid large mounds of soiled linen, which are ever rising and falling around her like the foam-crested waves of a chopping sea. Curious to see the daily items which composed the mass, we furtively glanced at the Washing-list—a document almost as big as a parish-register,—and "500 towels," "150 sheets," "57 tablecloths," at once informed us of the scale on which things are done at the Grosvenor.

Then there is the plate-room. The amount of plate

used by the hotel may be estimated when we say that four men are exclusively employed in keeping it clean. Regiments of tea-pots, officered by tea-urns, were being examined as critically as a company of soldiers by their inspecting general; and what shall we say of the tea-spoons but that their name is legion? The glass-room is presided over by a solitary hermit, who divides his time between a clever exercise of the muscles of the wrist in rinsing the articles under operation, and a professional cock of the eye in taking stock of its cleanliness: imagine, good reader, having to do this without intermission from year's end to year's end!

The still-room of a large hotel, when in full operation, is perhaps the most bustling apartment in the house: its name, therefore, is a complete misnomer. Here all the current articles of food are served out. There are drawers full of tea, sugar, and the thousand and one odd things required at the breakfast and dinner table. A waiter brings a cheque for a certain amount of tea, say a small tea-cupful, which is considered enough for one, and this he pays for himself at the bar—sometimes with a bone counter; these cheques or counters are filed by the retailer, and are made to tally with the amount she draws from the store. The store or general shop of the establishment is presided over by the wife of the Manager, who issues what is wanted for the day's consumption early in the morning to the heads of the different departments.

In the store-room, the diversity of articles is

extraordinary: there is a chest of cigars, for example, and not far off a hogshead of sugar, or a chest of tea; mops, brushes, packets of black-lead, house-cloths, are stored away on shelves with neatness and regularity. It is a rule of the establishment that a certain article is to last a certain time, and when it is worn out it must be brought back to the store to be exchanged for a new one. All these *débris* are immediately chopped up and destroyed, so that there can be no possibility of putting them into circulation again. Stock is taken of the stores once a month. Thus, as far as possible, waste and theft, those fruitful sources of bankruptcy in ill-managed hotels, are provided against.

The food departments are extensive and exceedingly well managed. The butchery is, in fact, a butcher's shop, with this exception,—that every article is prepared for the spit at a moment's notice. The fowls are trussed; the cutlets are trimmed and bread-crummed; the ham and bacon are prepared over-night for the morning meal; the quails have their aprons of bacon-fat properly fastened on, and constant forethought is exercised for the advent of the irascible traveller who wants an elephant steak in five minutes from the time of ordering it, and keeps on ringing the bell until it is served. The larder is calculated to feed the mouths of Gargantua. The kitchen of the Grosvenor reminds us of that at the Reform Club—all the same excellent arrangements, the same labour-saving appliances, in order to accommodate large numbers at the shortest notice. The

chef de cuisine, or head cook, as he better likes to be called, is a renowned man in his way, and certainly knows how to serve up a good dinner.

The service of this large establishment is conducted by thirty men and sixty-five women, the women all dressed in a simple black and white dress,—a good hint this, taken from our French neighbours, who insist upon a class dress for domestics. In all matters of detail the very best habits of the private gentleman's house are carried out in this splendid establishment; consequently the traveller may find all the comforts of home, combined with advantages which only a very large establishment can command.

We cannot help thinking the size of the Grosvenor is a happy medium; less than such leviathan houses as the Louvre or the Hôtel Grand, or Astor House, New York, it is not so large as to bewilder the guest, or to swallow up his individuality amid the mob located under the same roof; and yet it is large enough to contain within itself every necessary accommodation. It is not like Astor House—a mere collection of private apartments, inhabited by private families, covered by one roof; neither is it a gigantic *restaurant,* with bedrooms which are made to do duty as sitting-rooms, like the grand piles built by the Crédit Mobilier;—but it is a thoroughly English hotel, in which the family of distinction may find a princely home, or the single traveller, studying economy, may get a good bedroom for two shillings, the use of the splendid library for the mere price of the service, a breakfast for half-a-crown,

and as good a dinner of three courses as he could desire for five shillings, or for three if he wishes to dine economically. It is everybody's palace.

Let it no longer be said that the seed sown in the *Times* has borne no fruit, or that the hotels of the British metropolis are the dearest and worst in Europe. On the contrary, it has been clearly shown that a guest can live as cheaply in this grand hotel as in many of the second-rate hotels abroad, and certainly far more economically than our fathers used to do in the stuffy "White Harts" and "White Lions" of their day, with their slipshod, flat-footed, greasy waiters, their buggy four-posters, their splendid variety of "A steak, sir, or a chop, sir," or perhaps "a 'biled' fowl, sir," which inevitably composed the whole repertory of the *cuisine*, and with their beggarly servants who fleeced you in droves on your departure, never expecting or hoping to see you again.

THE "TIMES" NEWSPAPER OF 1798.

THERE lies before us one of the most eventful pages of that eventful year, in the shape of the *Times* newspaper, of October 3, 1798, reprinted from the original. The *Times* of that date, compared with its present size, was a veritable infant—not much bigger, when spread open, than a lady's pocket-handkerchief—but within its little face we see clearly its present features in embryo.

The Americans, with that self-consciousness which is so characteristic of the nation, are for ever "making history," and fidgeting themselves as to how they shall look in the pages of some future Bancroft. What a contrast to the dull Englishman of 1798, who "made history," especially in that year, without being at all aware of the dignity of his occupation. Let us turn over our *Times*, for example, and the first thing that strikes our attention is the account of Lord Nelson's Victory of the Nile. Our admirals then did their fighting better than their writing—a feature which some seamen of a later date seem to have reversed. The total annihilation of an enemy's fleet is narrated by our hero in fewer words than a Yankee

commander would detail the robbing of a hen-roost. Of the French fleet of seventeen line-of-battle ships only four managed to escape. They struck hard and heavy in those days without much boasting. In another part of the paper we have a glimpse of the rebellion in Ireland, a sighting of the Plymouth squadron sent under Sir Borlase Warren to intercept the Brest fleet which was sailing to reinforce the Irish rebels.

We see the working of the dogs of war in a far more vivid manner in these contemporary pages than in those of after-history. The *Anson* frigate sails so near the *Hoche* (French admiral's ship), that they can see "on board the whites of the eyes of the marines," with whom she is so crowded as to cause her "to sail badly." From Ireland, again, we have tidings of Major-General Trench's defeat of the rebels, "with great slaughter," in the neighbourhood of Killaloe; and there is a charming picture drawn of the French commandant of the town, cooped up with his officers in the Bishop's Palace, with that dignitary himself armed to the teeth against the very rebels he had come to succour. Then there are the paragraphs of courts-martial, in which it is thought sufficient to say "some have been hanged, and various punishments have been inflicted on others." Little paragraphs hint at the social condition of the period, and show what a robust habit the public had of expressing their opinions; everywhere physical force was in the ascendant.

A singular example of the license which roughs

were allowed in those days is given in a paragraph which states that a mob on the previous evening gathered round the entrance of the Admiralty in honour of the great victory; and adds:—

> They insisted on every person of genteel appearance pulling off their hats [*sic*]. Six officers passing along were ordered to pay the same compliment to the mobility, and, refusing to do so, the populace attempted to force their hats off. *The officers drew their swords*, and it is said that some persons were wounded.

This reads like a scene in a pantomime, or like some of those little Austrian or Prussian affairs we used to hear of, in which the supreme contempt of the military for civilians and the civil law was so conspicuous. Imagine half-a-dozen officers of the guard showing fight with their falchions to roughs now-a-days! Public opinion in those times of forbidden utterance through the press, generally found means to express itself in these rough and terrible scenes; and they were blunt of speech also in the most "genteel places." For instance, there appeared to have been an unusual amount of cat-calling and abuse of the musicians at Drury Lane that night, because having been wearied with playing "Rule Britannia" and "God save the King," they would not listen to a boisterous cry on the part of some individual for "Britons, strike home," a demand which was silenced by some one singing out in the gallery, "Why, damn it, they have, haven't they?" The recording of such little episodes as these is strikingly illustrative of the strong stomachs which our ancestors had for forcible language. The reader cannot get

far down a column without coming in contact with specimens of the violence of that age. We are told that—

> John Hanning, the seaman who killed one of the pressgang at Newhaven, was discovered hanging in his cell this morning,—

a hint at a double death caused by the working of the infamous pressgang law. The poor fellow was further followed by the vindictive usages of the times; for we are told that he was buried in the evening, in the cross-roads near St. Paul's, but that *the stake* commonly used on such occasions was dispensed with. The highwayman and footpad it is evident were then in full fashion; for there are no less than three highway robberies recorded as having happened on the previous day. Mr. Vernon, of the Treasury, and another gentleman, travelling in a postchaise, were stopped near Merton by two footpads, and were robbed of all their valuables. It does seem rather strange that *three* men—for there must have been a postilion—should have so quietly given in, to two rascals on foot. "Lieutenant Miller of the Horse-Guards was stopped by two highwaymen," and "Mr. Couvoisier, one of her Majesty's messengers, at Maidenhead," in the same manner.

An affair of honour is not wanting in this number of the paper to make the manners of the times perfect, for we are informed that one came off between Captain H—— and Colonel A——, on account of a supposed injury in Ireland; and there is a forcible abduction, too, of a Miss Mitchell, by a gentleman in

the county of Cork, which really reads like a case we heard of only a few years ago.

We have a hint, too, of a project on foot which has since been realized—namely, a tunnel under the Thames; but, in this instance, between Gravesend and Tilbury. There appears to have been just the same style of glorifying the "spirit of progress" in those days as there is now, for we hear that—

Among the wonders of the present day, Mrs. Siddons's late achievements at Brighton, Bath, and London should not be forgotten. She positively performed at each of these places within the incredibly short space of ninety-six hours.

Four days and nights! Not so bad by Palmer's mail; but how flat and slow seem the wonders of one age to that which follows! How near the chit-chat of a newspaper brings you to past events,—you can't help feeling yourself a contemporary. What life and movement; what petty details, all of which, however, are necessary to fill up the picture of the time, and to clothe the bones which History picks so bare. It seems as though we were talking to our grandfather when we read of John Kemble as Zanga, in "The Revenge," "finely marking the subtle and malignant spirit of vengeance" of the Moor; and one almost feels inclined to indorse the extravagant opinion of our grandpapas with respect to the grandiose actors in the stilted dismal plays of that day.

Mrs. Powell did not disdain the unimportant character of Leonora: a bright face like hers would indeed have lighted up any character. We wish some

of the actresses of the present day would emulate her disinterestedness.

The two great political figures of the period make their appearance in several parts of the paper. Mr. Fox, we are told by the Opposition papers, "does not mean to attend his duties in Parliament during the ensuing session," whereupon we have the editorial remark—the *Times* in those days was no namby-pamby Conservative, but downright Tory—

> However greatly the talents of this gentleman may be rated, the want of his counsel has not proved detrimental to the public service.

The Foxites, however, understood the sneer, and estimated it at its true value, for on turning to the advertising column we find that "the anniversary of Mr. Fox's first election for Westminster will be held at the Shakespere Tavern. The Honourable C. J. Fox in the chair." Where was the Shakespere Tavern situated? We see that the dinner tickets were only eight shillings, although dukes and earls were to partake of it; and the time was four o'clock. We have the authority of the editor, that, on October 2nd, 1798, Mr. Pitt was not laid up in flannel with the gout, as it had been reported, for—

> We saw him yesterday in the Park in perfect [*sic*] good health.

Even in the little paragraphs, the "we," it will be seen, is retained, giving us a notion that even such scraps in those days were picked up by the editor himself instead of by penny-a-liners as now. In the gigantic "Thunderer" of to-day, with its abstract

editor, we lose those little personal touches which bring us face to face with the demi-god that launched the dread bolts in those times.

As we write, the paper-boy comes for the *Times*, from which we have extracted a good pennyworth this morning, and we see him collecting his papers at door after door all the way up the street. What a comment this upon a little paragraph in the *Times* of October, 1798, to the following effect:—

The keepers of several reading-rooms in Fleet Street have been fined £5 for lending newspapers for hire.

What meddlesome stumbling-blocks were placed in those days in the path of the poor politician!

Whilst the "Emperor of Germany" was deciding his politics in the face of the French Directory, and the "Grand Signior"—what old-world titles these!—was acting with "decision and vigour," poor old George III. was at Weymouth, recruiting his poor shattered brain; and certainly the Court levelled itself to the meanest capacity in its amusements, if we may judge from the programme of the fête at Maiden Castle, near Dorchester, on the anniversary of the birthday of the Duchess of Wurtemberg, which runs as follows:—

To be played for at cricket, a round of beef—each man of the winning set to have a riband.

A cheese to be rolled down the hill—prize to whoever stops it.

A silver cup to be run for by ponies, the best of three heats.

A pound of tobacco to be grinned for.

A barrel of beer to be rolled down the hill—a prize to whoever stops it.

A Michaelmas goose to be dived for.

A good hat to be cudgelled for.

Half-a-guinea for the best ass in three heats.

A handsome hat for the boy most expert in catching a roll dipped in treacle and suspended by a string.

A leg of mutton and a gallon of porter to the winner of a race of 100 yards in sacks.

A good hat to be wrestled for.

Half-a-guinea to the rider of an ass who wins the best of three heats by coming in last.

A pig—prize to whoever catches him by the tail.

This was the age of Chloes and Phyllises, of Damons and Corydons, when shepherds piped to their shepherdesses on Dresden-china tea-cups, and made love in the tender verses of noble poets. We see what the amusements of the country people were, and how they attracted royalty.

If we turn to the advertisements — the glory of the "leading journal" of the present day—we see on what slight beginnings its present prosperity was built. The first page, as at present, and half of the last page contained then about as many as would go into one full column of the present journal. The nature of the advertisements of the last century differed but very little from those of the present day. "Elegant villas" and desirable mansions were advertised to let in much the same style as they are to-day. Even the public auction-rooms were the same: there was "Garraway's" in the city and "Christie's" in Pall Mall. Patent medicines cured all diseases as at present, and Dr. James's Powder was even then sold at "Newberry's in St. Paul's Churchyard."

There are some noteworthy things, however, even

among the advertisements. For instance, we see that a live male elephant and 1,095 elephant's teeth are to be sold at Garraway's "by the candle." This hints at a custom which dates from the time of Queen Anne, and was conducted this wise: a very small piece of candle was lit, and the biddings proceeded until it went out, the last bidder before which event took place claiming the lot. The intense anxiety existing whilst the flicker of the mould or the dip was at the last gasp induced much competition among the bidders, but it could hardly have been so satisfactory and decisive a method of sale as the sharp rap of the hammer.

There is something very illustrative of the times in the advertisement of "Miss Rutter's Boarding School," in which much stress is laid upon the instruction given in "useful and ornamental needlework." We have seen the results of this careful training in the faded old sampler-work framed in our grandmothers' houses. But Miss Rutter's pupils were indoctrinated into the useful as well as the ornamental, for we find there was a Mr. Rutter, who offers the "inestimable advantages to the young ladies" of the indispensable graces of domestic economy, and "a thorough knowledge in writing and arithmetic." Possibly if the present generation of young ladies were to think a little more of these things, and less of a smattering in half-a-dozen languages, it would be better, especially for those bachelors who wish to know "How to live on two hundred a year." But the question arises, what has become of all those young misses of Miss

Rutter's academy, of Morden Lane, Surrey? Is there an old lady in a mob-cap still living who can converse of the times of her youth? or are they all gone, "the old familiar faces" whose sayings and doings, goings and comings, are chronicled in this fragile, old, old paper, which seems to smile upon us with a smile of perpetual youth?

THE RESTORATION OF OUR SOIL.

THE Leading Journal startled its readers the other day by stating, on the authority of some great names in the domain of Chemistry, that the vegetable mould of Europe was gradually becoming exhausted—that our system of farming was, in fact, drying up the source of our daily bread; and that our over-stimulated fields required to revert to their primal condition of wood, and forest, and bog, to bring them back to a wholesome state of fertility. This was tantamount to saying that civilization was at an end, and that we must look up our old books of costume to see how we should appear once more tatooed in woad and draped with skins.

We do not happen to know whether Dr. Cumming has attempted to improve the occasion, by [illegible] forth another of his prophetic visions—possibly not, as the evidence tends to show that man must begin afresh, instead of finally closing his account with Nature: be that as it may, the statement was somewhat calculated to attract attention, and one not in the usual run of penny-a-lining.

Fortunately, it happened that not long before this

communication was made to the *Times*, the Queen's printers were issuing what we venture to predict will prove one of the most important Blue Books ever published—to wit, the "Second Report of the Select Committee on Sewage of Towns." It must have struck every thinking mind with wonder, that while our farmers were depending upon the refuse of flocks of birds in the islands of the South Pacific, and upon the bleaching bones gathered from distant battle-fields, the refuse of man himself lay decomposing beneath his feet in great cities, and giving forth exhalations which poisoned him in his own household. "Surely," the reflecting man must have said, "the excreta of birds which feed upon a limited range of food cannot be so rich in manurial qualities as that of the human race, within whose alimentary range all the edible products of earth are brought." The thought was so simple, and withal so true, that he felt almost inclined to place it among the class of grand principles which are very well to enunciate, but which are difficult to reduce to practice.

At all events, for years the public mind has done little more than dwell upon the problem, whilst those interested in our imported and manufactured manures have been active in throwing discredit upon the idea, and have been equally active in despatching fleets to the other side of the globe to fetch guano, and factories have been arising on every hand to mix composts infinitely inferior to that mixed for us in our house-drains, which Lord Palmerston has truly designated as only matter in the wrong place. Whilst

vested interests, however, have to a certain extent smothered the general idea floating in the public mind, and while indeed some public experiments, such as those at Rugby and Croydon, conducted on false principles, tended to discourage the belief in the new-found treasure, the efforts of individual minds have restored the problem to its original position.

With Englishmen an ounce of fact is worth a ton of theory; and when men began to see, here and there throughout the island, fields producing four and five crops of grass a year of astounding weight and quality, and when the land itself became quadrupled in value, it was natural to inquire how the thing was done.

Inquiry once stimulated, the battle was won; and now that a Parliamentary Committee have reported highly favourably of the agricultural value of the excreta of man in great cities, we think we may safely predict that in England, at all events, the time is near at hand when we shall no longer trouble the booby and other sea-fowl in the South Pacific Ocean.

It is certainly a most remarkable fact, that when we have to announce any new discovery, or to refer to any ancient one which has greatly affected mankind, we have to acknowledge the Chinese as the earliest originators. Printing, gunpowder, the mariner's compass, and half-a-dozen other great inventions, were well known in the Flowery Land long before this island had emerged from barbarism. But it seems stranger still to add that the simple expedient by which one of the largest empires—counting upwards

of 400,000,000 inhabitants—possesses, and has possessed for hundreds of generations, the most productive soil in the world, should only just now be known amongst our sharper-witted farmers.

If, according to a new theory, a slow exhaustion of the vegetable mould were really going on, we ought certainly to look to China for the strongest evidence of the fact; but Mother Earth is as strong there, possibly stronger, than she has been for a couple of thousand years; and the secret of this eternal vigour lies in this,—that the inhabitants never fail to *return to the soil those materials that they have taken out of it.*

Every morning the market gardener, who brings the day's supply of vegetables, takes away the sewage of the house. It may not seem very savoury to our ideas to find the produce and the producer thus nakedly and perpetually brought into contact before our eyes; but it is in this rapid circulation of the fertilizing agent that the whole secret of the wonderful productions of that vast empire is based. The Western nations build magnificent cities, which they undermine with a vast swamp of filth; hence the plagues of the Middle Ages, which, like sudden floods, depopulated cities, and the slow fevers, which at the present day make their constant lairs in our crowded courts and alleys.

We have had constant intercourse with China for upwards of a hundred years, but it is only lately that travellers have made us acquainted with this one great feature in their industrial life, which doubtless lies at the foundation of a civilization which

reaches without intermission long before the so-called Historic period.

But we must not be surprised at our blindness to foreign example, when we find that we have equally shut our eyes to an experiment that has been going on for upwards of two hundred years in our own island. When the advantage of sewage manure is referred to, the Craigintenny meadows, near Edinburgh, are named as the exemplar.

At present there are upwards of two hundred acres irrigated with the flow of the sewage of about 80,000 of the population. This land receives the sewage from the western part of the city, and after flowing over the meadows it falls into the sea. Some portion of this pasture, being in fact little better than a prolongation of the sea-beach, was originally worth five shillings an acre—it is now worth £30 an acre. This transmutation of desert land into pasture, off which as many as five crops have been taken in a year, yielding on some extraordinary occasions upwards of sixty tons per acre at one cutting, but averaging say twenty-five tons, is accomplished at an expense to the proprietor of not more than one pound per acre for the labour in irrigating.

This process is very simple: the sewage flows by its own gravity over the whole surface, not continuously, but at certain seasons, and in certain conditions of the Italian rye-grass crops, each acre receiving about 9,000 tons at each watering, which takes place about ten or twelve times a year.

It must be admitted that the extraordinary success

of these meadows is owing to the favourable lie of the land, which prevents the necessity for pumping arrangements; but there are scores of towns in England as favourably situated as Edinburgh for delivering their sewage at a mere nominal expense. Yet this extraordinary example has been in some unaccountable manner overlooked.

It is just possible that the vast amount of sewage per acre here employed has tended to make agriculturists doubt the possibility of applying this kind of manure profitably in other places. But there is no necessity for these heavy dressings; they are employed on these meadows as a matter of necessity rather than of choice, for the sewage must be got rid of, and this can only be done by passing it over the land into the sea.

The great value of the present Report is the conclusion it comes to, that light dressings at infrequent intervals succeed admirably. The importance of this fact cannot be too highly estimated, for the whole value of the sewage of towns, when it has to be carried any distance, depends upon the cost of distribution, especially in those cases where there is a necessity for pumping, in order to raise it to a high level, that it may flow by its own gravity to distant parts. It must be evident that to distribute superfluous water is to clog the experiment with destructive charges. How to get rid of this superfluous water, which so deteriorates the value of town sewage, is the great question of the day. Sir Joseph Paxton, in his valuable evidence, believes the time will come

when every house will have its hermetically-sealed tank, into which all the sewage proper of the house will flow. The tank he would ventilate by carrying a half-inch pipe from it up the chimney. That by this means all the unpleasant odour would be got rid of, he proves by the fact, new perhaps to our readers, that in this manner all the sewage of the Crystal Palace now deposited in tanks at the end of the south transept is ventilated through the pillars of the building, without the slightest odour being discovered, whilst the splendid bloom of the geraniums is the result of the sewage itself. As to the method of emptying these house-sewage tanks, he says :—

I can see a time, and I believe I could scheme it, if I could turn my entire attention to it, by which you would have in your cellar a glazed iron tank, and a small half-inch pipe running up the chimney, for the ventilation of this tank; and you would have a pipe going to the outside, with a top screwed on, and a locomotive engine with a large tank would go down your street, and they would hook on this, and they would draw out in three minutes all that you had got in the tank, without your even knowing anything about it, or having the slightest possible smell in the house.

With all due deference to Sir Joseph Paxton, we think it will be a very distant day before we shall scent his odorous locomotive at our doors, for the simple reason, that to employ a pump at every door, whilst one pump in the suburbs would answer every purpose, would be economically absurd. Sir Joseph, however, was right in recognizing the fact that we are destroying the sewage of our great towns by mixing it in our underground culverts with the rainfall,

To one of the members of the late Commission of Sewers the credit is principally due of pointing out this initial error, whilst battling manfully against Mr. Bazalgette's monstrous sewers, so constructed as to swamp the excreta of the town in the drainage of the rainfall of metropolitan area, which extends over fifty-nine and a half square miles, and pours into the sewers from 80,000,000 to 90,000,000 of tons of water annually—a scheme which threatens to starve the river, and undoubtedly spoils the excreta of 3,000,000 of people. As far as we can see, there can be no denying the truth of his formula :—

*The whole of the rainfall is due to the river; the whole of the sewage to the soil.**

This arrangement he proposed to carry out by maintaining the then existing sewers for their original purpose, the carrying off the surface-drainage to the river; whilst the pipe-water, enriched by the cleansing of our dwellings, he would collect in pipes, carry out of town, and apply to the land. The millions that have been spent in constructing the colossal system of drainage now being laid down in the metropolis may seem to preclude the introduction of this double system, and to destroy the possibility of saving the untold wealth it is planned to throw into the sea; but it is just possible that the metropolitan sewage may be intercepted at the mouth of each house-drain, and carried, by means of earthenware pipes, through the

* "Purification of the Thames:" a Letter by F. O. Ward, Esq., addressed to William Coningham, M.P.

great drains themselves. The house-sewage and the refuse surface-water flowing, like the vein and the artery in the human body, in the same enveloping sheath,—the one to afford splendid crops from exhausted fields, the other to supply a full flow to the Thames.

At all events, if such a scheme is impossible of accomplishment, we trust that the much-vaunted metropolitan drainage scheme will serve as an example to be avoided, rather than followed, by other towns, now that the value of sewage not too much diluted is placed beyond all dispute.

It certainly does seem extraordinary that in England, where economy of carriage is so well understood, persons should fall into the fatal mistake of carrying that which can be made to carry itself. Thus, at Manchester, upwards of 100,000 tons of night-soil, mixed with 30,000 tons of ashes — the deodorizing agent used in that town — are taken away annually by railroad into Yorkshire, Nottinghamshire, and Lincolnshire, at a great expense, and in a very objectionable form, for this solid manure is for ever giving off its most valuable constituent, the ammonia. But why trouble the wheels of the locomotive, when an iron pipe, at a slight incline, will carry the sewage in a far less objectionable manner? Again, at Chatham, the farmers, notwithstanding their familiarity with the cheapness of hydraulic power, send to the town, and buy the night-soil of the contractors, which the latter carry for them in waggons. At Ryde, in Lancashire, a company is formed for conveying the sewage

in a solid state, and has erected spacious premises for converting it into *poudrette*,—a process which Nature has to undo before the manure is available for the use of the plant, as water is essential to carry it to the roots. A field, however, thickly dressed with the best guano, whether home-made or Peruvian, can only obtain the advantage of it after a shower of rain, without which, indeed, the plants would be starved, just as a man would be in the best-stocked larder, provided he were chained by the leg out of reach of the tempting food hung around him.

These clumsy and needless methods of carrying and manufacturing an article which is already manufactured to hand in the best possible form, are not only conclusive of the ignorance which obtains with respect to the proper method of using it, but of its inherent worth. If town-sewage can be made a paying commodity after thus being converted into a manufactured article, how much more profit could be made out of it by allowing it to flow immediately it is produced, when rich with all its volatile constituents, from our houses on to our fields.

After all, the most convincing experiments are those which we make ourselves; and it luckily happens that the means of applying our house-sewage to the soil are at the disposal of any person having gardens or pastures surrounding his own house. One of the most conclusive experiments recorded in the evidence given before the Select Committee on the Sewage of Towns is that of Philip Skinner Miles, Esq., of King's Weston.

Every resident of Clifton and Bristol knows well the mansion of this gentleman,—an old gloomy house that once belonged to the Lords de Clifford, and built by the cumbrous genius of Vanbrugh. This seat is one of the show-places of Gloucestershire, and the grounds command one of the finest views in the kingdom. Vanbrugh, however, lived in the days before house-drainage was discovered, and the result was that the sewage of the mansion trickled down the side of the road which led to it. This disgusting nuisance was not only offensive to the sight, but in hot weather was very offensive to the nose, and the work of drainage became one of necessity.

Mr. Miles did not content himself with building an expensive drain, but, following the lead of Mr. Alderman Mechi, he determined to collect the sewage of his house (containing thirty persons), together with the rainfall, into a closed tank containing about 7,000 gallons, which he ventilated by a pipe running up the chimney, which effectually took away all smell.

The sewage was conducted by pipes to about twelve acres of grass and to two acres of ploughed land, and distributed by means of a gutta-percha hose. The result is that these fields have been improved in value from 55*s.* an acre to £5. 10*s.*, whilst the produce has been immensely increased :—two crops a year, so thick that they cannot stand up, and the crop is always good if the season be wet or dry.

This sewaged grass, moreover, comes in full a month earlier than ordinary grass, thus giving that "early bite," the advantage of which all farmers so

well know; moreover, the herbage is full and thick to the end of November.

The cattle are ravenous after the rich succulent herbage thus produced, and will eat it immediately the dressing has been applied; and Mr. Miles tells us that the dairy-maids cannot account for the great increase of the cream which has taken place since the experiment has been in operation.

This seems very like a transformation-scene in a pantomime, rather than reality. The foul and filthy lane, at a fairy's touch, becomes changed to a smiling meadow; the milkmaids are overpowered by the flow of cream, and the land is burthened with its crops; the stock gets rapidly fat, and the turnips grow so quickly as to get without the reach of the "fly."

The good fairy and the appliances, in this case, consist of an old man who can dress the whole of the fields in the course of the day; and the machinery is comprised in the tank, a small conducting pipe, and a hydrant with a flexible gutta-percha hose. Well might Lord Palmerston have remarked that "sewage was only matter in the wrong place."

What Mr. Miles has done any other person may do likewise; for the expenditure is but trifling, and the effect so great that it will pay all outlay in the course of two or three years. In this case it was proved that the excreta of each person was equal to the fertilization of half an acre of land.

For some little time yet, we look to the experiments of individuals as the best means of propagating the

idea; for it will take a long time to convince municipal bodies that their sewage, instead of being a nuisance to be got rid of, is a valuable commodity to be dispensed. But more valuable still, perhaps, will be the experiments of large institutions, such as county lunatic-asylums, where the cultivation of land is one of the means used to exercise and interest the patients.

We are glad to find that the visiting magistrates have already experimentalized in this direction, both at Colney Hatch and at Hayward's Heath Asylum; but the most satisfactory results have, we think, been obtained by Mr. Westwood, late farm-bailiff to the schools at Anerly (the inmates of which are about 700); and their value depends upon the fact that the experiments were made by a gentleman who acted under Government inspection, and was obliged to render exact accounts of his expenditure, and that they have a direct bearing upon the very important question of the best quantity of sewage to apply to the land.

Of the forty acres of land belonging to the school, four acres were under Italian rye-grass and twelve acres were in very poor meadow: indeed, the whole estate was a stiff London clay, very adverse to good cultivation. A tank containing 12,000 gallons of sewage was erected to work this land. The rye-grass of four acres was dressed by hose and jet six different times in the year, the whole amount being about 1,500 tons of sewage per acre; and the produce of these four acres fed "16 large dairy cows, one bull, and three or four head of young stock, besides three farm-horses,

for the summer months, or 180 days; each cow yielding on an average throughout the year eight quarts of milk per day. There was no perceptible difference in the crop over the whole four acres, all of it being as thick as it was possible for grass to stand. Therefore, taking that part irrigated with the hose and jet as keeping ten of the cows, the produce could not have been less than seventy tons of green food to the acre every season. I believe it is generally considered that one of the large half-bred short-horn cows, giving full milk, will eat at least 1½ cwt. of green meat per day: allowing 8d. per gallon for the milk thus produced, it would give £120 as the return from these two acres, and, without deducting the expenses, 9d. per ton for every ton of sewage used.

Assuming that this sewage had been delivered on the farm by a company, and charged 2d. per ton, the landlord or tenant having laid down the pipes on the farm necessary for its distribution, the expenses would stand as follows:—"1,500 tons of sewage per acre, at 2*d.* per ton, £25; one lad, distributing for twelve days, 12*s.*; rent of two acres at 25*s.*, £2. 10*s.*; half man's time cutting grass, milking, &c., £7. 10*s.*; part time of horse and cart, carting grass to sheds, £3; interest on cost and wear of pipes, hose, &c., 16*s.*: making a total of £39. 8*s.*, which deducted from the £120 would leave £80. 12*s.* as the net profit upon those two acres, supposing that no other deductions had to be made for keeping the stock in the winter-time."

When we hear a witness talk of producing *seventy*

tons of green food per acre in one season, it seems so much like romancing, that we have thought it well to give his own words, and to state that, in the opinion of the Select Committee, they are entitled to "very great weight."

It must be stated, that of these four acres of rye-grass two were allowed an unlimited amount of sewage, amounting to between 8,000 and 9,000 tons per annum; yet they did not yield a better result than the other two acres dressed with only 1,500 tons of sewage throughout the year, giving, in the words of the Select Committee, "*a most conclusive proof of the uselessness of the enormous dressings recommended by some of the witnesses.*"

And, we may observe, not only the "uselessness" but the perniciousness of such superfluous dressings; for Mr. Westwood proves that the meadow grass, which was irrigated on the catch-water system at the rate of 9,000 tons an acre, threw its sewage off by the drains almost unaltered in colour, and so strong that he thought it necessary to filter it before it flowed away into the brook, lest an action should be commenced against the Institution for polluting the public watercourse. He found that the knobs of grass which lay above the general level of the field flourished quite as much as those that received the whole flow of the sewage; and he concludes that the dressings of 300 tons, once in the Spring and once after cutting the first crop, would be equally effective with the largest dressings.

The settlement of the question "heavy *versus* light

dressings" is of great importance for other reasons besides the fertilization of the land. To say nothing of the pumping expenses it will save, there is the question of keeping our water-sources pure: a matter which cannot be insured if enormous quantities of sewage were to be pumped on to the land, to find its way down in a polluted state to the springs. We do not doubt that within certain limits the value of sewage-manure dressings will depend upon the degree of its dilution. A certain quantity of water is absolutely necessary to carry the fertilizing particles to the roots of the plants; but what that precise quantity is we have yet to find out. Owing to the ever-varying amount of rainfall which is allowed to dilute it, no exact calculations can be made of its value: indeed, the excreta of each person are estimated by two individuals in the report variously at 1s. 9d. to £1 per annum—a divergence which results from the absurd practice of allowing the rainfall to mix with the house-sewage, which would otherwise be represented by a tolerably invariable quantity to each inmate.

The evidence of Lord Essex, who has used the sewage manure extensively, is to the effect that it is applicable to all crops, and that it may be applied with advantage at all times of the year, excepting during hard frosts; but that it is expedient that the agriculturist should have the full command of the sewage, so that he may apply it when and in what quantities he likes. This points to the system of irrigation by pipes and hose and jet as the most convenient method of distribution.

Mr. Tufnell, one of her Majesty's Inspectors of Schools, who reports with respect to the rigid exactitude of the experiments carried on at the Anerly schools under his inspection, states that he found the second crop produced by the sewage was far more productive than the second crop produced by guano —a statement which accords with the assertion of all scientific agricultural chemists, that while guano and other manufactured manures exhaust the soil by over-stimulation, sewage manure permanently improves it.

We trust this statement will restore confidence to those who have been frightened by a letter in the *Times* lamenting the exhaustion of our vegetable mould under its guano treatment, and also the following remarks of the Committee, which will doubtless give a clue to the extraordinary evidence of chemists and others interested in the sale of foreign manures :—

> If the sewage of our cities and towns were utilized to the best advantage over suitable areas, it is evident that, as on the Court farms, little or no imported manufactured manures would be used; this would greatly limit the area now supplied by such manures, and would therefore reduce the profits of all those engaged in the importation, manufacture, or sale of manure.

When we know that we possess these treasures which now lie festering beneath our feet, the next question is how to transfer them to land. As long as it could not be proved to be a commodity that farmers could afford to pay for, neither they nor the ratepayers could be expected to have much interest in

the question; but now we have conclusive proof that the sewage of our towns is no longer a nuisance to be got rid of but a commodity to be sold, the whole community must feel a lively interest in the manner in which it is to be disposed of.

There can be no question that, if municipal authorities had the power to distribute the sewage over large areas, a very large reduction in the rates would result from its sale; but these powers are at present wholly wanting, and the fact is referred to by the Committee as a stumbling-block in the way of a relief to local taxation which has yet to be provided.

There seems to be a general impression that, as far as municipal experiments are concerned, those towns which lie high are sure of the most successful results, inasmuch as they possess the power of distributing the sewage by gravitation, thus getting rid of the cost of the pumping expenses and the fixed machinery. There are several such towns admirably situated. Thus Launceston, in Cornwall, could command a flow to at least 1,000,000 acres, from its high level; Malvern, again, overlooks the valley of the Severn, and has a gentle fall to that river for miles. The best portions of Bath are built upon the hills overlooking the Avon; and a very large population is located on the hills on which Bristol is built, much of the sewage of which flows into the stagnant floating harbour, rendering it one of the most unhealthy places in the kingdom, according to the returns of the Registrar-General.

In all these places, and indeed in many towns where

a flow of the sewage as small as 1 in 300 could be obtained, would be sufficient to command the agricultural district in their neighbourhood. But there is ample evidence to show that, by the use of the pump, cities lying low in valleys or on the coast could utilize their sewage with a profit. It has been proposed that the experiment should be tried at Brighton, where many elements of success are to be found. The drainage of this growing town is not yet accomplished. This is a great feature, inasmuch as a complete system of double drainage could be carried out—one that would allow a flow of the rainfall to the sea; and of the pipe water, or house-refuse, being gathered by itself into some tank, and thence pumped up in its concentrated state to the surrounding estates and farms.

We are told that 100 tons of sewage can be thus lifted 100 feet for a penny. A hundred tons of Brighton sewage undiluted with the rainfall would be worth three or four times the value of the ordinary mixed town-drainage; and we are told that the noble proprietors in the neighbourhood of the town would be willing to receive it on their land. Lord Essex, for example, would be too glad of it; and we should say that the ladies, who now bathe in the sewage which empties itself not far from the beach, would be equally glad of its absence—for here it is clearly "matter in the wrong place."

Lord Essex has given it in evidence that he applied 134 tons of sewage to two acres of wheat, and that on each he obtained an increase of produce worth

£3. 1s. 6d. over and above that of other unsewaged fields; and this, remember, with the sewage diluted with the rainfall. What his increase of produce would have been if he had used it in its concentrated state we scarce dare mention; but we feel not the slightest doubt that it would have been more than amply sufficient to pay his lordship and others who used it a sum sufficient to defray the plant and labour of pumping, and to go some way towards lowering the local rates.

At all events, we may feel quite certain that the enormous value of the liquid refuse of our houses is now ascertained beyond the slightest doubt; and there can be as little doubt, we think, that means will speedily be found to transport it from towns where it is a nuisance to fields where it will be a benefit, to the satisfaction of the tax-lightened rate-payer, the officer of health, and the agriculturist; and if not, we may reasonably ask the reason why not, as we are now spending annually many millions of money to bring the inferior fertilizer, guano, many thousands of miles to our fields.

Moreover, we may say that we must have this question answered at once, for it will not admit of delay. Agriculturists have been dreaming that the accumulations of guano are inexhaustible, and that thousands of years will elapse before the stores heaped on the islands off the coast of Peru will be consumed. Mr. Markham, however, who has made a careful estimate of the amount remaining in 1861, considered there was not more than 9,538,735 tons

remaining at that date, which, at the present rate of consumption, will only last until the year 1883.

Think of this, ye farmers who pin your faith on guano: in twenty years' time, if you do not manage to utilize the sewage at your own doors, the foreign article will fail, and the predicted exhaustion of the vegetable mould of the country will really begin.

And have our agriculturists for a moment considered of what the home-made sewage manure consists? China manages to keep up the fertility of her soil by simply returning to it the elements that have been taken from it, in the shape of the excreta of the population; but it must be remembered that we import as well as produce fruits of the earth, and that our imports of food alone amount annually to £75,000,000,—in other words, our own home-made guano contains the fertilizing elements not only of our own soil, but of that of all countries on the earth, from which we receive food into our island to the yearly amount we have stated, and the whole of which is now allowed to run to waste.

We trust, in conclusion, that our "exhausted vegetable mould" will speedily give the lie to the prognostications of the philosophical agricultural chemists who have so frightened our landowners, and that the picture of England returning to its aboriginal condition of marsh and forest only dwells in their own too-vivid imaginations.

THE UNDER-SEA RAILROAD.

After a man has been tossed, as in a blanket, for a couple of hours in one of the fast boats between Dover and Calais, and after his mind and body have slightly recovered from the steady survey of the boiling sea his infirmities have compelled him to take, he is not unlikely to read with avidity any scheme which proposes to abolish those rough favours of Neptune altogether, which generally forerun and terminate his annual holiday abroad. Whilst we have yet our sea-legs upon us, Mr. James Chalmers greets us with a scheme for a Channel railway connecting England and France. With a vivid recollection of two hours of perfect misery, we can examine it with a perfectly unprejudiced mind.

We must not be supposed, however, to imagine that Mr. Chalmers is original in his idea, neither does he say as much; on the contrary, the persistence with which projectors have schemed to link our tight little island to the Continent is urged by him as a sign of the necessity that exists for its accomplishment. His claim is, that he offers his method as the only practicable one yet presented to the public; and we must say that, compared with the many visionary

projects that would-be engineers have given forth, Mr. Chalmers' seems simplicity itself.

Seven of these schemes have been put forth by Frenchmen, and five by Englishmen, a proportion in favour of our neighbours which possibly represents their superior horrors of sea-sickness. Three French projectors proposed tunnelling under the Channel; five English and two French proposed submerged tubes; a Frenchman proposes an arched railway or tunnel on the bottom, and an Englishman a mammoth bridge.

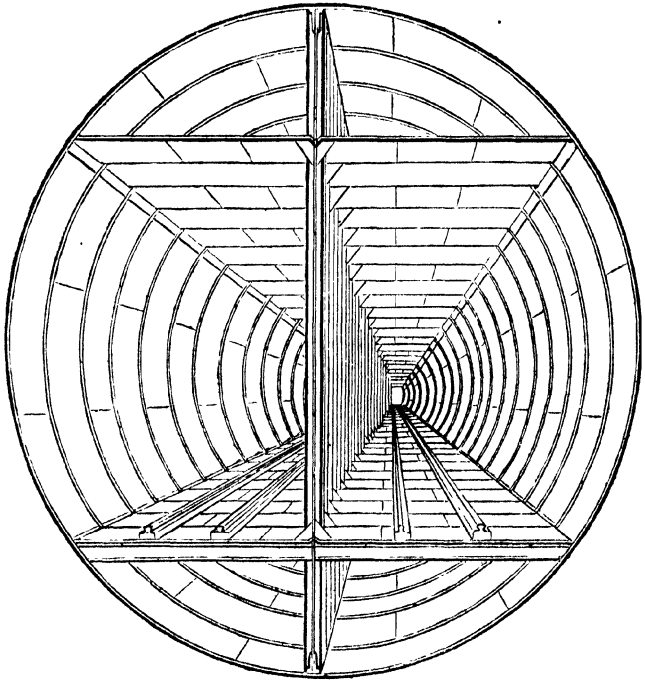
Of these schemes, that of the tunnel seems to have been received with most favour. The Emperor Napoleon—who seems to have a taste for solving geographical difficulties, himself suggested a scheme for severing the Isthmus of Darien, and powerfully supports the canalization of the Isthmus of Suez—only as late as 1857 received with no ordinary attention a scheme of M. de Gamond to annex England to France geographically by means of a tunnel. This project was a reversal of the mole's method of tunnelling. He proposed to form thirteen islands in the Channel, by depositing therein immense mounds of chalk and stones. Through these his project was to drive shafts, and, when at a given level, to tunnel east and west. The ostensible reason for the Emperor's abandonment of this scheme was the impediment these islands would give to the navigation; but we fancy the real reason was that he could not afford to throw money into the sea in so many directions at the same time.

The projector of one of the schemes for a submerged tube proposes to build it in one length on shore, and then to float it out to sea, and drop it at one dash. Poor Brunel should have been alive, to have either witnessed or had a hand in this magnificent engineering scheme, which far surpassed any of his own. Imagine the triumphant attitude of this engineer, wielding a tube only about twenty miles long, and for the moment of submergence, at least, ruling the waves between England and France! His task accomplished, however, poor travellers would not have been much benefited, inasmuch as he proposes to have the two ends of his tube made solid, and entered from either shore by chain piers, or by a small steamer!

The enthusiastic gentleman who suggests the arched roadway on the bottom of the strait proposes to construct it by the agency of forty subaqueous boats, and 1,500 sailors and navvies—sub-aqueous also, of course. The projector of the bridge would build 190 piers in the Channel, 300 feet square at the bottom, rising to 150 feet square at the level of the sea. On these pedestals he would build towers, 100 feet in diameter, 260 feet high; connecting his chain of towers with a tubular bridge far above the topmost truck of our tallest "admiral." When we remember that the mid-channel is about 160 feet deep, and that, say, at least 40 feet would be necessary for foundation, these mammoth towers would be about 460 feet high, rising from a base of 300 feet. Remember, good reader, our engineer does not project one of these

pyramids to be constructed in a restless sea-way, but 190!

Mr. Chalmers is jocular enough at the expense of the schemes of his predecessors, but there are a few items in his own which require explanation. His



Under-Sea Railway Tunnel.

plan is a tube reaching from shore to shore, in the still depths of the Channel. As this tube will have a powerful tendency to rise, it is to be weighted with iron boxes filled with rough stones, the whole to be

covered with an embankment of stones, which will form a ridge from shore to shore 150 feet wide at the base, 40 feet high, and from 40 to 120 feet below the level of low water.

This tube is to be enlivened with three ventilators, one in mid-channel, and one about a mile from either shore. As the tube is to be 18 miles in length, passengers will never be further from the light than 4½ miles. But an excursion-train, or perhaps half a dozen, within three minutes of each other, would possibly find themselves hard-up for breathing-holes, like the poor frozen-in seals sometimes in the Northern regions, so the projector proposes a system of artificial ventilation, by up and down draughts, such as we already have in our coal-mines. The necessity for such an adjunct is obvious enough, but it certainly is not calculated to give any favourable view of this new trajectus. But schemers are ever sanguine, and in the very weakness of his case he sees nothing but strength. One would think that a passenger would shut his eyes and rush under the roaring waters of the Channel with some such feeling as Schiller's diver ventured after the golden cup—only too glad if he came to the upper world all safe and sound. But no, Mr. Chalmers must make him absolutely enjoy both the *prospect* and his sensations!—

The cleanly painted light-coloured iron, and a thousand double lamps, one every thirty-five yards, will give a cheerful aspect to this ocean roadway, and render it an agreeable contrast to the noise and damp and darkness of an ordinary tunnel, *or even the miles of*

uninviting scenery that often meet the eye in broad daylight. The noise in the tube can be reduced to a minimum; unlike tubular bridges suspended in the air, the sound and vibration of the iron will be deadened and neutralized by the equability and elasticity of the pressure without; and as the situation of the roadway will admit of a perfectly united rail, the sensation that travellers will experience on entering the Channel railway will be akin to what we feel after walking on a gravelly road with thin shoes, when we step upon the downy sward of a smooth green lawn.

We really must congratulate Mr. Chalmers upon his project for providing the nation with a new source of pleasure. People may, perhaps, in future take a turn in his tunnel as they now do in a Turkish Bath, for the purpose of calming irritable nerves, or for ascending into that seventh heaven of dreamy delight which the shampooing process produces. Such a delicious place of meeting as this tube will afford cannot be overlooked for State purposes. After the next great war with France, and the next frustration of Napoleonic schemes, there will of course be a new Tilsit meeting between her Majesty and Napoleon in the neutral ground at the centre of the tunnel, and here, surrounded with the charming prospect of "cleanly painted light-coloured iron," with old Neptune playing Peeping Tom, perhaps, down the central ventilator, vows of amity for all futurity will be exchanged. Really, rose-coloured Mr. Chalmers, there is some such a thing as over-proving one's case.

We are by no means disposed, however, to employ our pen simply to disparage the efforts of those who are working in advance of their age. We confess we

believe in the ultimate accomplishment of a land passage under the English Channel. There is no part of that Channel, be it remembered, so deep but that St. Paul's Cathedral planted there would stand up head and shoulders out of the water. We know there are no great irregularities of bottom, for the first electric cable ever laid, without special care or knowledge, remained in perfect order for ten years, and when taken up the other day for repairs was found nearly throughout in as perfect a condition as when it was first laid down. This is Neptune's testimony to the calm condition of the water and the goodness of the bottom, and where a flimsy cable could remain so long a perfect pipe, able to resist all the efforts of one of the most subtle principles in Nature to escape into the surrounding water, surely a tube of iron could be found equal to maintain a free passage for man himself. The difficulties are all comprised in getting the tube once there.

Mr. Chalmers may well laugh at the idea of building a tube twenty miles long on land, projecting it like a large beam across the Channel, and then dropping it; but how does he attempt to get over the difficulty? He tells us he proposes to make his tube in lengths of 400 feet and 30 feet in diameter, and of joining them under water. He gives us, indeed, the most minute directions as to the manner in which these huge masses of iron are to be floated out and then sunk so that they shall be jointed together impermeably to the surrounding water. To read his scheme it would really seem as though the

whole thing could be done with as much ease as we join gas or water pipes above ground.

We all know the difficulties and the partial failures that attended Stephenson's floating of the tubular roadway to the Menai railroad bridge; but imagine, good reader, an operation of this kind, only a thousand times more delicate, having to be performed under the English Channel no less than four hundred times! Imagine the terrible aspect of an army of those hideous objects we see at given intervals plunging into and emerging from the diving-bell bath at the Polytechnic—creatures with hydrocephalous heads, and glaring brass-rimmed goggles, and extremities that seem a cross between those of an Arctic bear and a walrus!

When Mr. Chalmers tells us that this great undertaking can be completed for £12,000,000, and gives in detail his estimates for the value of the materials, which he puts at fifty per cent. above their possible cost, we are not inclined to disbelieve him; but what we do most certainly disbelieve is, that three years will be sufficient for such an achievement.

The elder Brunel was nearly beaten in making a roadway only a quarter of a mile in length under a river, the interruptions that took place in the course of the work amounting to years. Let the reader imagine, then, those difficulties magnified a thousandfold, and he will perhaps be inclined to believe that there are items rather more important in the calculations than the market price of iron, or of cubic yards of stone.

Granted that we can annex England to the Continent by a channel railway for £12,000,000, it will be readily conceded that the undertaking would be highly profitable. Mr. Chalmers, we think, places his estimate of a total annual revenue of £1,300,000 far too low. We cannot estimate the amount of either passenger or goods traffic that would flow by such a line. It would be limited, we believe, only by the mechnical capabilities of its trains. The rails which spread out upon either shore with such placenta-like ramifications, only require some medium of direct communication to exchange the very life-blood of the Continent with our own.

If one of the chief recommendations advanced by the proprietors of the *Great Eastern* was her freedom from motion and the abolition of sea-sickness, what may not be said in favour of a rail that would sweep away for ever that terrible affliction at present interposed between the personal communication of ourselves and the rest of Europe? The accomplishment of such an undertaking would indeed confer honour on any engineer. Already Mont Cenis is half drilled, and we see no reason why that greater Mont Cenis, the British Channel, should not be penetrated by some genius, backed by sufficient sinews of war.

HALF-HOURS AT THE KENSINGTON MUSEUM.



THE MUSEUM OF PATENT MACHINES, ETC.

Our museums are getting so extensive that it is becoming a most wearisome task to attempt to master their contents in the limited time sight-seers are generally able to devote to a stroll through them. All the world knows it is one of the most headachey things imaginable to spend a couple of hours among the miles of galleries in the British Museum; and the South Kensington Museum is becoming almost as confusing a place of amusement. We may have half-hours with the different departments, however, without coming away with that sense of mental prostration which invariably attends any attempt to "do" the Museum in one afternoon. There is one room in it, but not of it, which always throws open its doors free of charge — the Museum of the Commissioners of Patents, in which a whole Noah's Ark of machines and models meets the eye of the visitor. This exhibition is totally distinct from the South Kensington Museum, and only occupies a room temporarily until a building is erected by the Com-

missioners with the £90,000 and upwards they have in hand for that purpose.

In taking our survey of the riches of invention which meet the eye on every hand, let us first glance at its curiosities. In a glass case at the top of the room are several worm-eaten wooden pieces of machinery, which do not look unlike portions of Dutch clockwork on a large scale. On the foundation of these crumbling fragments the great staple of English manufacture has been built: these are the original spinning and carding machines of the barber Arkwright. When he used to leave his basin and his lather to plot and plan wheels and cogs, his wife used to scold him for not attending to his business. If that old dame could have seen in a dream the mighty results these ugly-looking engines were destined to give rise to in the course of a century—could see the millions of slaves enthralled to grow cotton for its delicate fingers to spin—could see the fleets of ships they called into existence to supply it with food—could see the great port of Liverpool they had created, the great city of palaces, Manchester, which they had built, the enormous fortunes which they had earned, and the comfort they had conferred on millions—she would have dreamed a dream which surpasses anything related in the "Arabian Nights," and with the addition that the dream was destined to come true. Let us make our bow, therefore, to those wormeaten old engines, and be grateful that their inventor had a mind superior to taking his customers by the nose.

By way of contrast to the rude models of Arkwright, we see close at hand a spinning-machine of the present day. The clumsy beams have given place to light ironwork, finished with the delicacy of a clock movement. Arkwright himself would scarcely recognize the transmutations his own germ has passed through in the course of a century. Not far off we see another of those great mother-thoughts which have moved the world during the present century: there is the original model of the first locomotive that ever ran. Mr. Trevethick, in 1802, conceived the plan of substituting steam for horse-power on the Cornish tramways; and here is the original idea of a power which has since revolutionized society. The original locomotive had but two large wheels and a small guiding wheel, like a perambulator, and was called by the country people the Puffing Billy!

The machinery was confined to a cylinder, a piston-rod with a cross-tree head, which communicated the motion by two shafts to cranks on the wheels; this was the original germ which developed into the existing complicated locomotive, a model of which is placed opposite to it. Trevethick's engine worked at the moderate pace of three and a half miles an hour, and carried coals only. George Stephenson improved upon this, and produced his engine, which carried passengers for the first time in 1829 on the Stockton and Darlington line, and continued working until the year 1850. This locomotive would have been an interesting addition to the machines in this room, but it is, perhaps, better where it is, mounted on a

pedestal at the entrance to the Darlington Station, where it takes its stand as the premier locomotive of the world. As it cannot be removed, an excellent photograph does duty for it, and clearly shows that its machinery was only an amplification of Trevethick's idea, the piston-rods, cross-pieces, &c., working perpendicularly over the boiler. But a still greater rarity is the beam-engine model made by Watt himself. This model works the steam-valve by what is termed the tippit motion. An additional interest attaches to it over and above the fact that it is one of the first ideas of the great motive power of the present day, inasmuch as Watt always kept it under his own observation in his drawing-room. It is but rudely finished, but the very fact that its great inventor's eye dwelt upon it with pride and triumph invests it with a poetry all its own. Another beam-engine, once belonging to Watt, with parallel motion attached to the piston-rod, is a better example of mechanical skill.

We have not far to look for the first germ of steam navigation. That huge model which appears to be a combination of two funnels and a number of chains working over wheels is the parent marine engine. As early as the year 1787, Patrick Miller, of Dalswinton, Scotland, engaged himself in making experiments with double and treble boats, which he propelled by means of wheels placed between them worked by manual labour; in the following year he induced one Symington, an engineer, at Wenlock Head, to apply to it a marine steam-engine he had

invented. This engine propelled the boat along Dalswinton Lake at the rate of five miles an hour. This was undoubtedly the first attempt ever made to use steam as the motive power in a vessel, although it was not the first practical steamboat. The engine which belongs to the earliest history of that invention is what is called an atmospheric engine—that is, the piston is raised by the action of steam, and then it is forced down by atmospheric pressure. The history of this curious parent of steam navigation is worth noting. After the trial in the boat, the engine was removed to Mr. Miller's library, where it remained until his death in 1815; in 1828, it was sent by his son, packed in a deal case, to Messrs. Coutts & Co., in the Strand, where it remained until 1837; and finally it found its way to a plumber's shop in Edinburgh, who flung it aside with the purpose of melting it. However, the model was rescued from destruction in 1855, and was restored to its former working condition by Messrs. Penn & Son in 1857.

It is usually supposed that the boat made by Fulton, in America, was the first practical steamboat; but that honour must be transferred to Symington, who, in 1801, perceiving that his old engine was too complicated to work practically, completed a new one with the later improvements by Watt and others, and placed it on board the *Charlotte Dundas*, which was, in truth, the first practical steamboat. The paddle was still a problem which puzzled mechanicians. Its best form, so as to offer the least resistance on entering and leaving the water, engaged the skill of hun-

dreds of thoughtful men, many of whose models are to be seen in the Museum. But other minds were intent upon superseding the wheel altogether, and at last Captain Smith's screw did so. We can all remember the fierce disputes there were among nautical men with respect to the relative powers of paddle *versus* screw—a dispute which was finally settled by the tournament which took place between her Majesty's steamer *Rattler*, screw steamer, and the *Electro*, paddle-boat, both of equal size and power. They towed stern to stern, and the propeller dragged the paddle after her at the rate of two and a half miles an hour. This victory seems to have put an end to all attempts to improve the paddle, and now human ingenuity seems concentrated upon the screw. The number of patents taken out for different forms of the propeller is something extraordinary, and the models in the Museum are in themselves a curiosity. Every degree of pitch that can be got out of a spiral would seem to be exhausted, and the favourite design of screw now appears to be modelled in the shape of a blade-bone. The screw of the *Rattler*, for instance, ten feet in diameter, looks like the remains of the scapulæ of some gigantic Ichthyosaurus. Thus we go on improving upon each other's efforts, every one adding some trifling improvement until perfection is attained.

Five minutes' walk through this Museum is sufficient to satisfy me of the profundity of the remark that "it is society that invents." Let us take the subject of steam as a motive power, and let us see how long

the idea has been before the world. Here, on the walls, we find a coloured drawing of Hero's steam-engine invented one hundred and thirty years before Christ! We can scarcely conceive that whilst Pan was still young, and whilst great was Diana of the Ephesians, the thin white vapour which now moves the world was even then dandled as a second infant Hercules. Hero's idea of the application of the elastic force of the youthful giant was confined to simply projecting it against the resisting medium of the air: a hollow spindle connecting with two arms turned in opposite directions being filled with steam, the two jets acting on the air, gave the simple machine a revolving action. What centuries of thought lie between this and the great engine of the Leviathan steamer, a model of which is to be found in this room!

In these centuries we find the names of Solomon de Caus, Giovanni Branca, Torricelli, the Marquis of Worcester, Denis Papin, Thomas Savery, Thomas Newcomen, and Watt, to say nothing of the host of inventors who have added improvements in the present century. All of these studious men have nursed the mighty infant through the ages, until its limbs present their present gigantic proportions; and yet we say, familiarly enough, that steam is still in its infancy; and, without doubt, the New Zealander, could he exhume the museums of science of his day, will be able to read a list of improvers of steam as numerous as those we have already had.

Another great element of our present civilization

is beginning to make signs of its existence in this Museum. We allude to the electric telegraph. Bakewell's Copying Machine is one of the most interesting of this class, as it brings before the public eye the means that can be employed to write with a pen thousands of miles in length. If the Atlantic cable were in working order, for instance, a man through its instrumentality could sit down to write a letter in London, and feel certain that a facsimile of his handwriting was at the same moment coming out of the telegraph office at New York! The manner in which this astounding machine works is as follows :—The message is originally written on a conducting material, such as tinfoil, with resin or some non-conducting ink. Over the face of this letter, which is placed on a cylinder, a point of metal revolves—this point is in connection with the conducting wire ; at New York, say, a piece of chemically prepared paper is placed on a like cylinder to receive the message ; both cylinders are made to move round by clockwork. As the point at this end of the wire passes over the non-conducting resin writing, no current passes ; hence the point which moves synonymously with it at New York does not change the colour of the paper, but all the other surface of the writing tablet being a conductor, the currents pass and deepen its colour by chemical action on the far-distant recording tablet. The receiver thus obtains a perfect facsimile of his correspondent's handwriting done in white upon a blue ground. Specimens of this electrical handwriting are

placed beside the telegraphic machine, and afford an admirable example of the caligraphy of the lightning-pen.

The great practical puzzle of the present day—submarine [illegible] ...vours to find its solution in dozens of different specimens of electric cables. When it is remembered that the problem to be solved is to produce some envelope which shall perfectly isolate and protect a conducting wire, running for thousands of miles, as the Atlantic cable for instance does; when it is further remembered that a fault in the covering material of the wire only as big as a pin-hole speedily becomes enlarged to the size of a sixpence by the burning action of the electric fluid passing out into the water; when, again, we know that gutta-percha, with which cables are covered, is liable to the attacks of insects, to be abraded by rubbing on sharp rocks; and when we find that in shallow water cables are always liable to be dragged up by ships' anchors, the difficulties of making them electrically secure are indeed immense. Hence hundreds of patents have been taken out to accomplish the desired end, and thousands of miles of ruined cable, representing some two millions of money, now lie at the bottom of the ocean, subjects of great curiosity no doubt to the fishes.

We have been noticing hitherto different forms of the great inventions which have changed the face of society within the last quarter of a century; but the Museum does not shut its doors to ingenuity employed in even the smallest objects. Here, for instance, is a

collection of ancient and modern locks,—some of Chinese, some Indian, and some Egyptian origin, all giving testimony to man's familiarity with this little instrument before the Christian era. In these, all the leading features of the tumblers in our best locks are to be found. The Indian padlock may be said to depend upon its security for its moral influence! It is made in the form of a bird, representing the Hindu deity Garuda. The works are of the most trumpery kind; but it is supposed to owe its security to a fear of the vengeance of the deity whose image it represents. As a pendant to this moral lock, are the keys poetical which once gave freedom to Mary Queen of Scots from Lochleven Castle.

Sewing-machines of all kinds are here, of course; but we were struck with an invention calculated, we think, to give relief to the needle-woman in a still more marked manner. A machine to mend stockings has always struck us as a great desideratum: our inventor, however, professes to accomplish his object in a more expeditious manner. Noting that stockings wear out only in two places, at the toes and heel, he manufactures these pieces at a cheap rate, in order that they may be pieced on at home.

Another ingenious man has patented a sweeping-brush, which runs along the carpet on rollers, and collects all the dust in a covered box. The advantages of this machine are, that it does its work without scattering the dust; therefore the housemaid need not cover the furniture up while pursuing her cleansing work.

Another individual, who still further labours to ease the domestic servant, exhibits a patent for peeling potatoes and apples, and for mincing meat; and the gas engineers show working models of different gas stoves, which supersede the use of coal fires altogether.

The introduction of new materials and the cheapening of old ones has given rise to their applications in articles with which their use would, on *à priori* grounds, appear totally inadmissible. Here, for instance, is a glass pump, working with an india-rubber valve; and it seems strong enough to resist any ordinary rough usage. Close at hand is a mangle, the bed and rollers of which are made of the same fragile material.

The introduction of india-rubber has, we know, revolutionized whole trades, and the glass cases in the Museum are filled with specimens of the purposes to which, under different forms, it is applied.

How little did we dream in our school-days that india-rubber was destined to play the part in the world it has done during the last quarter of a century. The many waterproofing purposes to which Messrs. Mackintosh have applied it we are all familiar with, and the change which takes place in its nature on the application of a little sulphur we also know; but the public, unless they visited the Museum, would scarcely dream of the extent to which its consequent increased resiliency has caused it to displace the use of steel in the form of springs,

and of packing of all kinds, in order to make air-tight joints.

Yet another change is induced in this Protean material: by simply baking it, we get what is termed ebonite by the Messrs. Silver, its discoverers and patentees. This substance has all the appearance of jet, with this advantage,—that it is tough instead of brittle; hence its applicability to a thousand uses in the arts and sciences. We see here chains which cannot be told from the best jet, combs, paper-knives, statuettes—anything, in short, which can be moulded, and requires a high finish and polish. These specimens of the manufactures carried on at "Silvertown," in the Isle of Dogs, are full of the deepest interest, and prove how quickly many of our oldest established trades may be prostrated by the discovery of some new material, or the chemical change which may be induced by scheming men in an old one.

Not the least attractive feature in this Museum is the collection of portraits of great inventors. The marked individuality in every countenance is very observable. But these are the lineaments of the famous and fortunate discoverers. The philosopher must in his own mind draw a picture of the amount of care and struggle represented by the great mass of patents in this room. Of the many years spent in efforts which have only terminated in the total impoverishment of the thoughtful toilers; of the many hopes blasted, of the castles in the air that have been transformed to dismal prisons, we do not see here the expression on the canvas, but be sure

they have existed, and will exist as long as there remains in man an irresistible impulse in the path of progress, and a God-like energy to pursue it at all cost and sacrifice.

THE FOOD DEPARTMENT.

When the visitor has given up his umbrella, he sees before him a staircase which even *habitués* of the place do not often ascend, tempted as they are by the art-collection around them. If he does happen to wander in these upper latitudes, he finds himself in a region of raw material, very interesting to those versed in manufactures, and especially in the great textile manufactures of cloth and wool, but not so attractive to mere pleasure-seekers.

Beyond this long gallery, however, is the Food Department of the Museum, which contains many explanations of necessary household truths, and also many curiosities calculated to interest and instruct. At the very threshold of the apartment we are met with selected specimens of the many varieties of wheat and maize grown throughout the world. It has long been suspected that the cereal grains are but cultivated examples of wild cereal grasses—that they were not created as corn, but that they have been improved by culture into their present condition. This supposition was confirmed by M. Fabre, of Agde, in the south of France, who, in 1838, sowed some grains of the *Ægilops ovata*, a common cereal grass, and, by successive sowings in garden soil, produced,

in 1846, crops of real wheat as fine as any to be found in the neighbourhood. This experiment is now being carried on by Professor Buckman, and the grass is gradually undergoing the same transformation into the true cereal grain.

The production of the oat-plant from a common field-grass has been demonstrated by experiments made by the same gentleman. Rye is still found wild in the mountains of the Crimea, and barley has been gathered in a like condition in Mesopotamia.

As there are a great number of wild cereal grasses yet to be found, these experiments would lead us to conclude that innumerable varieties of wheat may yet be brought forth by careful culture, as there is reason to believe that nearly all the existing varieties have been cultivated from the *Ægilops ota*. These facts should stimulate our agriculturists to further investigation in this direction. The cases at hand contain specimens of the different methods of making bread. A loaf of the ordinary fermented bread, made two years ago, represents one mass of green fungi, whilst other bread made without fermentation, and still older, is quite free from these growths. The Director of the department should obtain some specimens of bread made by Dr. Daugleish's process, which presents, perhaps, the purest form of the staff of life yet known.

In other cases we find bread made by savage tribes. The Dika bread from Africa looks and cuts like Castile soap; it is full of vegetable oil, and would form a famous bread for cold localities. Then there is the New Zealand native bread, resembling

lumps of yellow ochre, being, in fact, the pollen of a common reed.

The most curious article in the shape of bread is a very ancient specimen, which, together with dried apples and the stones of various fruits, was found in the Lake of Zurich. It is known these remains are coeval with what is termed the Stone Period, or that far-distant age before the natives discovered the use of iron. It would seem an impossibility that so perishable a material as bread could have survived for so many thousands of years as it has done; but analysis proves that it is true bread, and there can be no doubt that it is rightly ascribed to the remote period in history given to it. There can be little doubt that the like remains of the aboriginal inhabitants of this country are yet to be found in our own lakes.

Whilst we are upon the mere curiosities of food, let us direct the attention of the visitor to the specimens of edible snails. He will smile when we inform him that it is an undoubted fact that the consumption of them is so great at the present time in Paris as to interfere perceptably with the sale of oysters.

The most singular articles of food are to be found among the cases dedicated to the Chinese and Japanese. Here we see brains of the sturgeon, birds' nests, deer sinews; glue from the deer-skin, rhinoceros and elephant hides, and sharks' fins. The Chinese, it appears, are very fond of a gelatinous kind of food. Their sweetmeats are of a very superior kind, and extremely like our own,—indeed, the little

Celestials suck lollypops that may be matched any day at Fortnum & Mason's. The range of bottles containing these Chinese comfits look so tempting, that we are informed they have been broken open and cleared, more than once, by British youths.

The extent to which seaweeds are made an article of food by different nations would scarcely be believed, were they not placed here before our eyes.

In looking at some of the specimens in the Museum, we are inclined to ask if it is a natural exposition, or an advertising medium for some Teetotal Society. Here, for instance, is a goblet filled with a verd-green fluid, and one beside it with a dull olive-black mixture. On carefully scanning the labels attached to them, we find they are intended as tests of the presence of alcohol in a person's breath. Thus, the dull dark-green is a solution of bichromate of potash in sulphuric acid. This specimen, after having been breathed through for half an hour by a teetotaller, retains its original colour; whilst that subjected to the breath of an individual who had taken a glass of brandy-and-water half an hour before, is grass-green in appearance. What is intended to be proved by thus ostentatiously holding up the hues of a glass of liquid we cannot conceive. Who wants to hunt up even the very ghost of Alcohol in this absurd manner? It is bad enough to find our old friend Cruikshank adulterating the text of our fairy-tales as he has done in his illustrated edition with teetotal nonsense, but to find Science stooping to such fanaticism in a public gallery is quite unpardonable.

Not far from the drunkard's breath-test we find an enormous bottle filled with water. Innocent as this looks, it is intended as a libel upon the spectator. For we read upon its rotund surface the following: "Average quantity, $3\frac{4}{9}$ gallons, of alcohol consumed yearly by each person in England in the form of beer, spirits, &c."! Imagine the good old lady upon my arm—a dear old soul that never touches anything stronger than Bohea—reading this teetotal flam, and wondering, if she really does drink gin-and-water to this extent, who pays her spirit merchant. The absurdity of taking a general average, and then [illegible] it personally to every spectator, is patent enough. But the ingenious contriver of these moral lessons has not done with "Stiggins" yet, and, by implication, all that read share the crime of Stiggins. He is attacked through his exhalations and through his fluid ingesta, and now comes a more solid argument in castigation of his beastly drunkenness. This is shown us in a glass case full of grain, with this inscription: "Amount of barley, $1\frac{1}{2}$ bushels, destroyed by producing the yearly average consumption of ardent spirits by each person in England. That amount would feed a full-grown man for forty days." If, in addition to these cases, Mr. Gough could persuade the Directors of the Museum to have one of the attendants placed here, and daily "fuddled" as a "horrid example," the teaching would be complete.

After seeing alcohol in the form of the mildest table ale thus ruthlessly hunted down, it certainly is not reassuring to turn to the cases in which the teas are

exposed, and to find they are so adulterated. Here we see before our eyes the Prussian blue, the chromate of lead, the French chalk, the clay, and the hundred and one odd dirts which go to adulterate ordinary tea, and to make up lye tea, in which there is not a particle of the real leaf present.

If we turn to the Adam's ale supplied to us in London, we are still further puzzled what to drink. Dr. Lankester has run up the full gamut, if we may so speak, of the filth found in the Thames from Southend to Thames Ditton. The various shades of nastiness are brought clearly before our eye; but that organ must not pride itself upon being a sufficient detective officer to the stomach. On the contrary, some of the very brightest water to be found among the bottles devoted to the surface-well waters of the Metropolis are positively the most deleterious. That sparkling bottle, to wit, from the celebrated Aldgate Pump, which absolutely tastes even better than it looks—so cool, sparkling, and refreshing—owes its qualities to the presence in it of the nitrates drawn from the neighbouring churchyard; that other bottle, so clear and limpid, is proved by Clark's test to be, in fact, turgid with lime. Again, the purer the water the more open it is to another danger,—the more apt it is to act upon lead and form a solution which entails the most deadly symptoms on all partaking of it, especially young children. Think of this, Paterfamilias, and of the leaden cistern you rejoice in, and remember that your filter is powerless against this deadly ingredient held by chemical action in your drinking water. When we consider that the

human body is mainly built up of water, that, taking a man of 154lb., 43lb. of solids are held in a solution of 111lb. of the former element, we are tempted to ask how the great waste that must be going on of the aqueous element in the human frame is healthily restored, seeing that the drinking water in cities is so far from pure. No doubt, if the full measure had to be made up by libations of Thames or well water, however purified, it would go ill with us; but, happily, Nature distils the element for our use in the food we eat, which, like the human frame, may be said to consist mainly of water.

The cases of teas are worthy of inspection, if it were merely for the curiosities they contain. Some of the first-class teas — such as the superfine Flowery Pekoe—is never seen in this country; even in China it is worth fifty shillings a pound. The specimens here look much more like pieces of brown and grey wool than the ordinary tea of commerce, whilst some choice packets, once in the possession of Commissioner Yeh, might well be mistaken for bird's-eye tobacco. Tea is fast becoming the great beverage of the human race. It is estimated that 400,000,000 of men now use it. As a nation, however, England is the great consumer; for whilst we use an amount which may be reckoned as 35¼, the United States consume only 16, Russia 4, and France 1. The teetotaller will be surprised to hear that tea contains a volatile oil which is narcotic and intoxicating. Its chief value, however, resides in its crystalline principle, which prevents rapid change or waste in the

fleshy parts of the body, and so economizes food. One often wonders how old women can manage to keep themselves alive upon their dish of tea, taken morning, noon, and night; but the mystery ceases to be so great when we see the chemical action it exerts upon the tissues. Moreover, tea is more sustaining to the poor than the rich, for the reason that they use soda with it, which extracts the nitrogenous or flesh-forming principle of the leaves. Tea contains many other nutritious ingredients, but cocoa is greatly richer in these than tea. In a hundred parts of cocoa no less than 50 are butter, or heat-givers, and 20 of albumen, or flesh-formers. The value of this article of food as a nourishing diet for hard workers in cold countries is thus conclusively shown. The plan of analyzing the different articles of food, and of tabularizing their results, as we find is here done in the various cases, is of the utmost importance, as it teaches the public the true worth of different articles of food. Any intelligent person, from a study of this department of the Exhibition, would, with a little care, be able to construct a dietary on the most economical and efficient principle. If, in addition to these analyses of food, some statistics could be given of the nature of the alimentation of the different counties in Great Britain and of different nations, together with the average amount of work the consumers were capable of, the instruction this Department would afford to social science would be incalculable. For instance, the labourers in the north of England and in Scotland are capable of much harder work than those of the southern counties, and this is very justly

attributed to the superior flesh-producing powers of oatmeal used by the former over that of the watery potato, which forms the chief food of the peasantry of Somersetshire and Dorsetshire. If it could be made clear to the farmer that it is to his interest to feed his labourers well, we should doubtless see a change for the better. He will give any price for manures to invigorate his land, because he knows his returns will be more than commensurate. Prove to him that by affording Hodge wages that would insure him a more highly nitrogenized food, and that, in consequence, he would be able to load two dung-carts where before he only loaded one, and the problem of elevating the labourers of the country would be speedily solved. It is asserted that an adult labouring man wastes 5oz. of muscle in the course of his daily labour. Some men—such as navvies—waste much more than this; but taking this as the average, we find a very interesting table given in this part of the Exhibition, which affords a good idea to the public of the relative value and cost of various kinds of diet necessary for restoring this amount of waste:—

	lb.	oz.		s.	d.
Wheat Flour	2	1	average cost	0	4½
Barleymeal	2	6	„	0	4½
Oatmeal	1	13	„	0	4½
Maize	2	9	„	0	7½
Rye	2	3	„	0	6
Rice	4	13	„	1	2
Buckwheat...	3	10	„	1	0
Lentils	1	3	„	0	5
Peas (dry)	1	5	„	0	2¾
Beans (dry)	1	5	„	0	2
Potatoes	20	13	„	0	7
Bread	3	13	„	0	6

The reader will not fail to observe how wide this scale ranges both as to cost and as to the bulk of the food required to be taken to supply the normal waste of man. Whilst 1lb. 5oz. of either peas or beans are sufficient for this purpose, no less than 20lb. of the watery potato are necessary to produce the same result. It is clear that the apparatus required to eliminate the muscle-producing elements from such a heap of potatoes must be stretched to more than its usual size,—and we find the fact to be so; for whilst the Irish peasantry depended almost entirely upon this food, their stomachs were so unnaturally large as to render them the most pot-bellied nation in Europe. If we were asked what meal supplies in the smallest compass the two great sustainers of life, carbonaceous and nitrogenous food, we should point to the labourer's *bonne-bouche*, a dish of bacon and beans; thus we see that the instincts of man lead him to the very same results as the most careful chemical experiments do the philosopher in his laboratory. We may, as a general rule, depend upon our taste as a faithful guide to our alimentary requirements. It is not a rule of life, as some sour dietetic Solons would have it, that "whatever is nice is wrong;" and when the child clamours for lumps of sugar, be sure that it is wiser in its generation than you, good mother, for denying it; for sugar supplies, in the most digestible form, the [illegible] food so necessary for its preservation. But it may be asked why, when we wish to show the amount of food necessary to supply the daily waste of the organic matter in the body, we refer to vege-

table products. The chief reason is, that meat to the poor man is a luxury rather than a customary article of diet; and another that all the elements of animal food are to be found in the vegetable world. To use Professor Playfair's words: "The nutritive or flesh-forming parts of food are called fibrine, albumen, and casein: they contain the four elements, carbon, hydrogen, nitrogen, and oxygen, in exactly the same proportions, and are found both in vegetable and animal food. Fibrine may be got either by stirring fresh-drawn blood, or from the juice of a cauliflower; albumen, or white of egg, from eggs, from cabbage-juice, or from flour; casein, or cheese, exists more abundantly in peas and beans than it does in milk itself. . . . . Vegetables are the true makers of flesh; animals only arrange the flesh which they find ready formed in animals." If we go further down in the chain, we find all food in the *débris* of the rocks, for the breaking up of these form the earth, from which it is eliminated by the chemistry of plants, to be further sorted for man's use in the bodies of animals. We thus see how significant and literally true is the term we apply to the earth of "our great Mother."

The Directors of this Department, having analyzed nearly every article of food which ministers to the wants of man, sum up by reducing man himself to his elements. The spectator at the end of the long gallery is suddenly brought up by a large glass case, thus ticketed: "Ultimate elements in a human body weighing 154lb." Everybody is curious to look at

his own contents, and consequently the glass case is generally crowded; and we fancy many an old-fashioned person is inclined to doubt that his corpus can be converted into such a "doctor's shop" as he here sees solemnly ranged in bottles of all sizes. Can it be possible that the tank, containing sufficient water for a good-sized vivarium, represents the amount of that element in an average man perfectly free from the dropsy? When we are told that a human being of the mean size contains 111lb. of pure liquid fluid, we can understand why there are so many thirsty souls in the world. Then we see his fat in a bottle, looking like so much bear's grease, and find there is 15lb. weight of it. His 15lb. of gelatine looks painfully like the glue of commerce. Still more monstrous does it seem to think that his too solid flesh is reducible into the phosphates of lime, carbonates of lime, and the various sulphates of iron, magnesium, potassium, sodium, silicum, and fluorine which we see paraded before us with such hard, dry, chemical cruelty. But what are those large white blocks meant to represent? These are the measures of our gases. Thus we are told that a block one foot square represents the amount of oxygen in our economy, but that our hydrogen would occupy 3,000 such blocks! Good gracious! enough to build a pyramid, to say nothing of the chlorine and nitrogen. We enter this Department with feelings of curiosity, but leave it with wonder, and a sense of the *reductio ad absurdum* to which our chemists have reduced imperial man himself.

OH, THE ROAST BEEF OF OLD ENGLAND!*

THE steadfast character of the Englishman is, no doubt, an important element in our national greatness. We are slow to enter on new ways, and equally slow to desert them when once entered. The character of immobility has, however, its serious drawbacks; if a slow-moving man once goes deliberately wrong, he rights himself in as sluggish and deliberate a manner. This is just the case with John Bull in his character as a stock-feeder and breeder. Some years since (we scarcely like to say how many, for our memory of adipose exhibitions on Christmas-eves goes back a long time), the custom came in of bloating out oxen and sheep with oil-cake until they became mountains of fat, the delight of Baker Street, and the ultimate triumph of butchers. Every year saw the evil increase. Hodge with one hand poured in more oil-cake and with the other pointed to the triumphant result, — shapeless, blear-eyed, panting, miserable

* This article was written in the year 1858, but, as far as we can see, our fat beasts are as rampant as ever.

beasts, reduced by art to the condition of a huge heap of oil-globules. In vain the Press, with the *Times* at its head, protested that the true end and aim of the grower of British beef did not consist in converting rump and sirloin into kitchen candles; in vain they pointed to panting pigs and fat-legged oxen as a most melancholy and impotent conclusion to all his labours. In vain the public voice has condemned the system of giving prizes to pigs because they cannot see for fat, and premiums to oxen because their backs are flat as tables with adipose stuffing. The Fat Cattle Exhibition still flourishes, and John Bull pours his oil-cake and other carbonaceous food into his stock, with the same regularity as Betty pours Colza oil into the moderator lamp.

We cannot, however, help attributing this persistence in a bad direction as much to the ignorance of the public as to that of the feeder and breeder. The idea is universally prevalent that the nutritious character of the lean is in a direct ratio to the quantity of the fat. Your streaky sirloin is always looked upon as a "picture;" and no doubt the presence of fat in moderate quantities is a guarantee that the animal has lived a peaceful enjoyable life, and has been well supplied with the good things thereof.

If the public and the meat-grower would only stop at this point, all would be well; but they seem to consider that they cannot have too much of a good thing, and accordingly prize oxen, pigs, and sheep grow bigger and bigger as Christmas-tide comes round; the kitchen grease-pot flourishes, and

the public will not be convinced. Mr. F. J. Gant, the assistant-surgeon to the Royal Free Hospital, instead of expressing a mere opinion and many vague generalities, determined some time since to notice the condition of a few of the best prize beasts, and then to follow them up to the slaughter-house, and extract the truth out of them by means of a *post-mortem* inquiry. The result of Mr. Gant's highly interesting labours appeared in several of the town papers, among which may be mentioned the *Morning Post* and the *Observer*. He painted what he saw with a picturesque pen worthy of a more noble theme. In looking about him at one of the late Baker Street Exhibitions, he says he could detect no external sign of disease, except in two Devon cows, Class 4, Nos. 32 and 33 prize, each of which was suffering from a disorder of an internal organ :—

One of them looked very ill, and laid her head and neck flat on the ground like a greyhound. I pointed out these animals to a man who was drawing water, and I asked him if their condition was one of common occurrence. He said, "I know nothing of them beasties in p'ticler, but it's the case with many on 'em : I knows that."

Having thus accurately noticed the decrepitude of the beast with a scientific eye, and ascertained from the helper that it was illustrative of the class, he passed on to the pigs, those wonderful pigs of Prince Albert that *always* carried off a prize. We beg our readers to admire the delicacy of the finish with which Mr. Gant gives us a picture of the pathognomonic condition of these animals :—

They lay helplessly on their sides, with their noses propped up

against each other's backs, as if endeavouring to breathe more easily; but their respiration was loud, suffocating, and at long intervals. Then you heard a short, catching snore, which shook the whole body of the animal, *and passed with the motion of a wave* over its fat surface, which, moreover, felt cold.

The gold-medal pigs of Mr. Morland, marked "*improved* Chilton breed," were even in a worse condition than those belonging to His Royal Highness: "their mouths lay open, and their nostrils dilated" at each inspiration. These animals the judges "highly commended."

"When," says Mr. Gant, "I contrasted the enormous bulk of each animal with the short period in which so much fat or flesh had been produced, I certainly indulged in a painful reflection on the high-pressure work against time which certain internal organs, such as the stomach, liver, heart, and lungs, must have undergone at such a very early age." He therefore determined to follow the animals up after death, which he accordingly did, removing the hearts, livers, and lungs of the various prize beasts from the different slaughter-houses where he had seen them killed, and submitting them to a careful examination, the results of which will perhaps serve to shake the too prevalent idea of the public, that "the thicker the fat the better the flesh."

The first animal he examined was a fat wether belonging to the Duke of Richmond. The heart of this animal weighed ten and a half ounces; "its external surface was very soft, greasy, and of a dirty brownish-yellow colour. . . . On opening the two ventricular cavities, their external surface and substance

were equally soft, greasy, and yellow throughout—an appearance due to the infusion of fat between the muscular fibres, of which the heart should chiefly consist. This substitution of fat for muscle is proved by the microscope, to have ensued, *for when examined, the muscular fibres no longer presented the characteristic cross markings (striæ of anatomists), but the fibrillæ within the fibres were entirely broken up by bright globules of fat.* The healthy structure of the heart had, therefore, thoroughly degenerated by its conversion into fat." Another fat wether, bred by Lord Berners, had a heart degenerated into fat, "a gorged liver," "flabby lungs," with "nodules of the size of a kidney-bean imbedded in them."

Mr. Morland's "improved Chilton breed" pig had an enlarged left ventricle, a liver of a dark livid colour, while the veins of the left lobe of the liver were congested. The Prince Consort's Devon heifer presented a heart *with the substance of both ventricles "completely degenerated into fat."* The Earl of Leicester's three-year-old Devon ox had an equally fat heart. A short-horned ox, "the best in any of the class," had a heart whose left ventricle "had undergone conversion into fat." *One spot near the apex of the left ventricle had given way, and a blunt probe could be readily introduced through the substance of the ventricle* almost into the cavity, the thin lining of the cavity alone preventing the instantaneous death of the animal. The "best beast," a Devon ox, bred by the Prince Consort, presented a heart partially converted into fat; the intestines, within about a foot

of the termination of the lower bowel, presenting "a fatty-like mass."

Such were the pathological discoveries made by Mr. Gant in his examination of the viscera only. The conclusion that gentleman comes to—a conclusion in which he is strengthened by the testimony of Mr. Quckett—is, that the conversion of the heart into fat is the most prominent disease and the unfailing result produced by our present system of rearing and feeding stock.

Against this most important conclusion it will be vain, however, for the butcher to battle. The common sense of the country must see that a beast with a spoiled heart cannot be a healthy one; that the unworkable heart and oppressed lungs can only languidly circulate unhealthy blood; and that the various tissues built up out of the vitiated life-fluid must be unwholesome and void of those nutritious qualities which, at present, they are supposed to possess in an eminent degree. Now that fattening for the wasteful grease-pot is condemned by benevolence, and the last word of science, we trust to see prize beasts "grow small by degrees and beautifully less;" and if the exertions of Mr. Gant should lead to this result, he will deserve the thanks of the country, for it is of the utmost importance that healthy meat be supplied to a nation like ourselves, which depends for its strength upon its proper supply of animal food. Indeed, we are glad to see that in the last Agricultural Show there was a tendency to give the prizes to good points rather than to the mere obesity we have condemned.

MUDIE'S CIRCULATING LIBRARY.

TWENTY years is sufficient in these days entirely to revolutionize any speciality, trade, or profession, or indeed, for the matter of that, any mundane thing. If in our youth we had been asked to point out a particularly sleepy occupation on a level with the exertions of a genteel and advanced spinsterhood, we should have reverted instinctively to the circulating library, whose spiriting was generally performed by some meagre and somewhat sharp-visaged virgin in spectacles. The flow of well-thumbed fiction which she mildly regulated never gave signs of an uncontrollable exuberance of life, and the books of travel or adventure she dispensed speedily, became fossilized on her shelves. The circulating library of those days was a thing outside the bustling, active sphere of trade — a quiet eddy, as it were, in which placid minds took refuge. In these days, however, when the demands of society create such numberless new schemes, and erect into first-class occupations what were before insignificant handicrafts; when match-making has arrived at the dignity of a great manufacture, a single employer often consuming

annually a dozen shiploads of timber, and great fortunes are made out of steel pens, is it to be wondered at that the spirit of enterprize has penetrated even into the sleepy old circulating library, and transformed it at once into a very mill-race of literary life?

Standing the other day at the counter at Mudie's, where the Subscribers exchange their books, we were a witness of the transformation one enterprizing and intelligent man has wrought in this branch of trade. The constant flood of people that are discharged from broughams and chariots into this emporium of books reminds one more of the Pantheon than of a mere circulating library. Doyle, in his "Sketches of Society," has surely overlooked this famous sketching ground. If an artist could photograph the eager faces that throng the long counters of this establishment, he would be enabled to give us a rare picture-gallery of intelligence.

But in order to obtain a true idea of the importance this great circulating library has obtained as an educational element in society, we had better get an insight into the machinery by which the reading world is now so plentifully supplied with knowledge. Let us begin by saying that Mudie's Library, since its commencement, has issued to its subscribers not less than 1,263,000 volumes—it is true, a vast number of these in duplicates; nevertheless, they represent the amount of reading issued to the public by one establishment alone.

At the present moment the establishment owns no

less than 800,000 volumes. If all these were to come home to roost at one time, it would require a library almost as big as the British Museum to hold them. As it is, the house is one mass of books. Upstairs are contained the main reserves from which supplies are drafted for the grand saloon downstairs. This room is itself a sight. It is not a mere store-room, but a hall, decorated with Ionic columns, and such as would be considered a handsome assembly-room in any provincial town. The walls require no ceramic decorations, for they are lined with books, which themselves glow with colour. Here, perchance, a couple of thousand volumes of "Livingstone's Travels" glow with green; there stands a wall of light blue, representing the supply of some favourite novel; then, again, a bright red hue running half across the room testifies to the enormous demand for some work of adventure. Light iron galleries give access to the upper shelves, and an iron staircase leads to other books deposited in the well-lit, well-warmed vaults below. Light trucks are perpetually circulating about from room to room laden with books. Then, again, the spectator sees solid stacks of books piled about in odd places, just as he sees bricks stored near some rising building.

Descending into the vaults, he finds the shelves laden with parcels of books in their cerements of brown paper: these are the books that have already been read. They are not, however, as yet considered dead, as upon the issue of new works by their authors (supposing they be popular ones), they rise again, and

live for a time a renewed life. Some, however, are utterly past and gone: there, in a huge pile, for instance, lies a large remnant of the 2,000 copies of "Essays and Reviews," originally issued to subscribers, the demand for which has almost entirely ceased; not far off are the exhausted 1,000 copies of the famous *Quarterly* number in which the "Essays" were answered.

But there are still rooms in which books out of demand are being made up for sale, to go the round of country circulating libraries, ere they are finally at peace. We were curious to inquire if volumes ever became exhausted in Mr. Mudie's hard service. Broken backs and torn leaves are treated in an infirmary, and volumes of standard value come out afresh in stouter and more brilliant binding than ever.

There is, however, such a thing as a charnel-house in this establishment, where literature is, as it were, reduced to its old bones. Thousands of volumes thus read to death are pitched together in one heap. But would they not do for the butterman? was our natural query. Too dirty for that. Nor for old trunks? Much too greasy for that. What were they good for, then? For manure! Thus, when worn out as food for the mind, they are put to the service of producing food for our bodies!

The machinery by which all these books are distributed over the length and breadth of the three kingdoms—and even to France and Germany—equally partakes of the wholesale style in which

everything is done in this establishment. Of old it was thought a great thing to be able to get a supply of a dozen books at a time from a library, but Mr. Mudie sends whole libraries at once to some subscribers. Thus for the highest class subscription a hundred new books are despatched, and changed as often as required. This liberal arrangement has entirely superseded half the labour of country book-clubs, athenæums, and literary societies. Instead of buying their books, they get them in the gross from Mr. Mudie, and of course can afford to supply their readers with a much larger number than they did of old for the same money.

It must not be supposed that this great lending library is constituted on the principle of the inferior ones we have been so long accustomed to, where the bulk of the volumes consists of novels. This class of literature scarcely amounts to a third of the volumes circulated by Mr. Mudie. The great majority are composed of books of travel, adventure, biography, history, scientific works, and all the books of *genre*—as they say in painting—which are sought for by the public.

We can perhaps give a better idea of the nature of the most popular works by mentioning the circulation obtained by some of them. Macaulay had the honour of first bringing before the public the system of Mr. Mudie. In December, 1855, when vols. iii. and iv. of his "History of England" were published, it was announced that 2,500 copies were at once supplied to this library. The public looked on in astonishment:

it was the number contained in many a respectable library. This number has, however, been far surpassed since. Of Livingstone's "Travels in Africa" 3,250 copies were in circulation at one time. Here there was a union of religious readers and those fond of scientific travel and adventure, and at the lowest calculation not less than 30,000 readers must have been introduced to the work of the great South African traveller through the medium of this establishment. This alone is fame to a moderate man.

People are very fond of saying that nobody reads poetry now-a-days; yet 1,000 copies of "Idylls of the King" were necessary to supply the demand for Tennyson's last new book. M'Clintock's "Voyage in Search of Franklin" was another great success: 3,000 volumes were at one time "reading." A very singular illustration of the effect of theological controversy upon a book was made evident when "Essays and Reviews" were first published, inasmuch as fifty copies remained for some little time unread upon the shelves. As the idea arose that they were a little naughty, the demand began to increase, until ultimately Mr. Mudie had to place 2,000 copies in his library.

As a rule, novels have a short life, and not a merry one. We must except, however, some of the very first class, such as those of Miss Evans; 3,000 copies of "Silas Marner," for instance, were necessary to supply the demand. Thackeray, Dickens, and Trollope are of course always asked for, and Carlyle and Kingsley, again, seem never out of fashion.

The peculiarities of readers are evinced by the style of their reading: thus one well-known and celebrated man confines himself to the Waverley Novels,—when "Count Robert of Paris" is done, beginning again at "Waverley." Then there are the sluggish and the omnivorous readers. Many persons will read only one book during their subscription, whilst one lady, for her guinea subscription, read a number of volumes which, if purchased, would have cost her £200.

Town subscribers generally change their own books over the counter, and the bustle of the scene may be imagined when we say that, on the average, 1,000 exchanges are effected in the day, representing not less than 3,000 volumes. Suburban subscribers are supplied with their exchanges by cart, and those living in the country have their own boxes; these are of all sizes, from those holding four volumes to the monster packages holding one hundred. Upwards of a hundred of these boxes are received and sent out each day. Taken altogether, no less than 10,000 volumes are circulating diurnally through this establishment.

The amount of reading this represents is enormous, and it cannot be denied that, as an educating power, this great Circulating Library holds no mean position among the better classes of society. Its value to authors, moreover, cannot be lightly estimated, inasmuch as its machinery enables a bountiful supply of their works to be distributed to the remotest parts of the island, thereby increasing their reputation in

an ever-widening circle. What a gulf of time seems to separate us from that age when the only means the great master-minds of our noble craft possessed of making themselves known to the world was that of cringing to some noble debauchee, or of beslavering a gouty earl in a sycophantish dedication!

PHYSICAL EDUCATION.

How many of the good qualities of Englishmen do we owe to our love of games and field-sports! How many of the splendid empires we have founded in every quarter of the globe have had their root and spring in the tussles at football at Eton, the annual boatraces on the Thames, or the cricket-matches on the thousand downs and heaths throughout broad England! The dominant race of the earth—that race which has already seized upon every unoccupied corner of the world, and mastered the most thickly peopled—is dominant because it is great and masculine, because its tastes and habits lead to self-reliance, and because its breeding leads to the development of endurance, courage, and pluck. We have been so accustomed to the habits that foster these noble qualities that we do not, we believe, thoroughly appreciate them—nay, we do not perceive that a current of opinion has set in among a certain small minority amongst us which, if carried to its full extent, would do much to unman the Englishman and to degrade his physical nature to the Continental standard. We have only to look across the Atlantic to see how easily

the healthy, jolly, muscular Englishman can degenerate into the sallow, dyspeptic, lantern-jawed Yankee. No doubt the influence of climate has very much to do with this falling-off of the race: at the same time, it cannot be denied that a very large share of this deteriorating process is due to the false habits of our descendants themselves. A New England farmer is ruddy enough and stout enough, but your citizen of New York is so different a creature that we scarcely can recognize him as of the same race. The *Philadelphia Evening Journal*, in an admirable article upon the sorry appearance of the American citizen, thus draws a typical portrait:—

> The incipient man (we take an extreme case) is a thin, frail creature. His face is sharp and sallow, and has a bleared and bilious appearance. His back can be spanned with both hands, and there will be some hand to spare. The muscles of his arm consist of soft, loose lumps, which give to the touch; his chest, even with the aid of stiff-starched dickey and bulging vest, don't protrude perceptibly, and never makes the mildest attempt at a heave; his legs are matters to be implicitly believed in without any solid proof as to their reality. In fact, the last-named members have become so appallingly lean and same-all-the-way-up, that the tailors have established a wide, flabby style of integuments, into which they slip and are lost, the external effect on the casual observer being agreeably deceptive.

Such is the picture drawn by one of themselves of an American man! Out of the solid Englishman, how comes it that the product is this wretched scarecrow? The editor himself gives the reply—the body is wholly neglected for the mind; there is no such thing in the States as manly games. If you were to ask an American "to take a constitutional," he would stare

with wonder; the Yankee schoolboy would think the English lad mad to strain so at football, or to try his wind in the foot-race or the boat-match. The fairer half of creation across the "herring-pond" have still further degenerated from the standard of their mothers of England; flat-breasted, round-backed, and "rotten before they are ripe," to use a vulgar but forcible expression, instead of being, as was said of Michael Angelo's women, "models of generation," they only seem capable of passing on a fast declining race. The breezy ride upon the heath, the long country walk, the natural attitudes of the maidens of the old country, are unknown to them, and we see the result; they are old women at forty, with black teeth and withered frames.

The *New York Times* in an able leader says:—

The unbalanced despotism of the intellect is the sorest social curse under which we labour in the United States. Sports of all kinds, and especially the hearty athletic sports which develop the body with the brain, and bring forward the sharp, quick, active qualities of what may be termed the "physical" mind in an equal degree with the subtler faculties of ratiocination, have never been encouraged among us as they should have been. Our muscular nature rarely gets a fair chance in our life. We exist by and for the nerves; and it is no fanciful theory which attributes the sudden excesses and equally sudden relapses of political feeling, the partizan intolerance, and the coquetish impatience of our public life in no small degree to the want of national games and pastimes, mainly joyous and earnest.

No greater instance of the national importance of physical training could be given than the course the American Civil War is now taking. Notwithstanding the tropical climate in which the Southern soldiers

have been "raised," yet their athletic habits and their perpetuation of old English exercises have rendered them far more than a match for the reedy Yankee,—so much so, that we have seen them successively conquering in every engagement, and performing marches which have completely bewildered and circumvented their enemy, who, although bred in a colder climate, has ignored all physical training, and has reduced his manhood to the pitiable scarecrow described by the *Philadelphia Evening Journal*. When, in the hour of a nation's agony, it has to appeal to the last resort of battle, the value of physical education becomes but too apparent; and we do not doubt that, in the great struggle we now see being brought to a conclusion in America, the Federals would not have lost honour, as they most certainly will empire, had they trained themselves for soldiers by the sports and pastimes they should have learned in their youth.

Whilst Brother Jonathan awakens to a sense of his error, we fear there is a tendency, on the part of the authorities of some of our great schools, to fall off from our good old ways. Dr. Hawtrey, some years since, attempted to abolish the annual cricket-match once played in London by the Etonians; and now we are given to understand that boating is considered injurious to the rising generation. We have heard it stated by University authorities that the majority of the boats' crews that pull in the Oxford and Cambridge match are either ruptured or affected with aneurisms! That a poor weakling may overstrain himself here and there in these trials of strength and

endurance, we do not doubt; but to deny this splendid exercise to the youths of our great schools on account of these exceptional breakdowns, would be as unreasonable as to prohibit the use of wine or spirits because "Stiggins" gets drunk. The universities and the great public schools, as we have before said, set the fashion of games and sports to the youth of this country; and we think that medical men should express themselves heartily as to the wrong direction these schools are now taking in these matters. With respect to the more manly sports of the people, there cannot be a doubt that the numerous Acts of Enclosure have powerfully affected them for the worse. The humane tendencies of the age have banished all the rougher sports of our ancestors. Pugilism, bull-baiting, bear-baiting, dog-fighting, cock-fighting, have justly gone; but what have we in their stead? Physical force is ignored. A boy must not be whipped at school if he has done wrong; but the enlightened philanthropy of the present day substitutes an imposition which gives him a headache! With all our respect for the philanthropy of the age, we cannot help thinking that, as regards physical education, it has been content to destroy without building up—to push the head at the expense of the thews and sinews; and to make a clever, sharp lad, instead of a strong, enduring, and self-reliant man. Woe be to England when these qualities shall have departed from her sons! They may be adepts in all the "ologies;" but they will be no longer the bold, healthy, *out-of-door Englishmen*, whose good sense springs from their

sound health, and whose love of adventure and power over men are learned in their contests with their fellows, and in the vigorous pursuit of all health-giving exercises. In our opinion Muscular Christianity did not reappear upon the scene a bit too soon, and we hope it will put to flight the last namby-pamby notions that still linger among some of our authorities at the great schools.

FRAUDULENT TRADE MARKS.

We have all heard of the tricks of our American cousins — of their wooden hams, fictitious nutmegs, and contract boots with the soles pasted on, and many of us have come to the belief that all the rascality is to be found on the other side of the herring-pond. This doctrine is comfortable, but unhappily it is not true. We have before us now a Parliamentary Report on Trade Marks and Merchandise Marks, two subjects on which our own Government lawyers are essaying to legislate. What a seething mass of roguery runs beneath the smooth surface of our so-called civilization! If anybody doubts the truth of this remark, we recommend him to take a turn for an hour at the thin Blue-book before us. Mr. Roebuck, some time ago, scared the nation with a recital of the manner in which foreigners were forging the Sheffield trade marks, and the evidence contained in this Report fully warrants his statement. It appears that we are gradually losing our foreign cutlery and hardware trade in consequence of pirates over the sea. We suffered of old from the Northmen and the Danes who

swept our coasts, but now they penetrate into the very heart of the country, and snatch the bread from our working men. Our readers doubtless know that the excellence of our cutlery has long become famous throughout the world, and also that the seat of that trade is concentrated principally in Sheffield. The excellence of the wares there produced, is guaranteed by the affixing of certain trade marks upon them by the different manufacturers of eminence belonging to the Cutlers' Company. Let us instance for example the knives of Rodgers and Son. If the reader possesses a pocket-knife of this maker, and opens it, he will see that, in addition to the name, there is a Maltese cross and a plain cross stamped upon the shoulder of the knive. This is the trade mark,—the endorsement of the firm with respect to its excellence. This trade mark is very valuable: possibly, the manufacturer would not sell it for £20,000. There are other trade marks almost equally valuable. An adze-maker will select as his mark or emblem a pipe, another will put on a hatchet, another a lion, a fourth a goat, according to the class of men whom the tool or implement is likely to reach. The reason why trade marks are stamped on this kind of "dry goods" is that they are often made for a distant market, where the peasantry can understand a simple emblem, when they would not be able to read a maker's name. The Canadian backwoodsman, for example, has found that his old adze marked with a pipe was excellent; he therefore demands a new adze with a similar mark upon it. The name of the maker he may not be able to read

any more than the savage to whom these goods are sometimes sold.

Now here a fine field for forgery is open, and some of our friends across the water have not been long in availing themselves of it. Ramscheid and Solingen, in North Prussia, it appears, are the seats of this nefarious trade. The manufacturers in these towns keep a regular assortment of forged English marks, and send them out to the order of their customers as a matter of course. The traveller for an English house happening to be in the former town a short time since, one of the manufacturers observing the name upon his card, remarked, "That is our trade mark, too," and illustrated his position by pulling down a parcel with the spurious articles thus stamped with the forged mark. He perfectly well knew that the article was spurious; but the roguery had been perpetrated so long, that he absolutely imagined that he had a right to the mark by prescription. No sooner, we are told, does an English trade mark become famous abroad, than the agents for the German houses immediately send word home to have it forged, and within six months a consignment of the spurious article enters the field, at a rate so low that the genuine article is driven out of the market. The roguish Prussian manufacturer not only destroys our Sheffield trade in this way, but he has the audacity to mark the rubbish he sells at a low rate with some celebrated English maker's name or emblem, and puts the name of his own firm upon a better-class article. He then goes to the customer, and says, "Here are the inferior English

goods at a dear price, and here is our own make at a cheap one." In this manner many of our manufacturers who used to supply the South American market have been obliged to relinquish the trade. The shipment of these fraudulent goods is managed so adroitly that our foreign customers are sure to fall into the trap. Thus, for instance, the goods are sent from abroad to Hull, and are there transhipped for some foreign market. When they have arrived, it is advertised that so many cases of Rodgers' cutlery, or of some other celebrated name, have just been landed from an English ship.

As far as Englishmen are concerned, there is now existing in Sheffield a system of trade marks which prevents piracy. These laws are, however, operative only in the county of Hallamshire, as the district including Sheffield and a radius of six miles around is called; but outside of Sheffield the only remedy against fraudulent imitations of trade marks is by an injunction and proceedings in Chancery; and we all know how very unsatisfactory such a method of obtaining justice generally is. The cutlers of London have also a law, by which the use of the word "London" is prohibited to any manufacturer of cutlery residing at a distance of ten miles from St. Paul's; but any article may be stamped with the address of any street in the metropolis, provided this word be omitted. The purchaser may therefore be certain that a knife marked "London" is "town made."

But, it will be asked, will not the Prussian Govern-

ment—the Government which professes to rule over the best-educated nation in the world—give us a remedy for this abominable system of forgery perpetrated by their manufacturers? Unfortunately, no. There are excellent laws by which a Prussian can obtain redress against a Prussian for infringing his mark or forging his name, but this law does not extend to foreigners. On the other side, the Prussian can obtain justice in England against an Englishman committing the like offence; but then our process of proof is so expensive, and the result of law-suits is so uncertain, that foreigners do not care to put our laws in force. It might be otherwise if we had a treaty with the Prussians as we have with France, where we have absolute protection for the mere fee of registering, which costs only two francs; but if we hope for a treaty with Prussia, we must be able to offer them something in exchange for what we get: their Government would rightly say, if we give you the advantage of the cheap Prussian law to protect your manufactures, we must have something better than your cumbersome English law, which is practically inoperative to protect us Prussians. This is so reasonable that we trust the Bill about to be brought into Parliament will give us some cheap method of registration of trade marks which will protect us at home, and by reciprocity abroad, from the frauds of piratical manufacturers.

But we must not grow Pharisaical and thank God that we are not as other men, for the pages of this

very Blue-book unfortunately prove that we have just as much roguery going on in our tight little island as can be found abroad. We have all heard, for instance, of an operation called "shaving the ladies," yet we doubt if any lady is aware of the very clean shave she is constantly undergoing. If she is accustomed to frequent "cutting shops," where the stock is periodically thrown into a state of convulsions in its efforts to sell itself off, of course she expects to be done; but possibly she does not know that for years the trade in "small wares," as it is termed, has been losing its conscience in the most remarkable manner. There is, in short, a regular conspiracy to cheat between the manufacturers and the great wholesale dealers. If a lady, for instance, buys a reel of cotton marked a hundred yards, she imagines, possibly, that she gets that quantity. Miserable delusion! There are not more than seventy. All goods, again, that are sold in the piece, run short: "short-stick," in fact, is a slang term for insufficient lengths.

Some of the wholesale middlemen will send up labels to the manufacturer indicating false lengths, and they are put on, as a matter of course, by many spinners. The Britisher is thus cheated out of 30 per cent. of his goods: but that is nothing to the way in which the Yankees plunder. Thus they will forge some well-known name, say in thread, and they will keep lowering the lengths on the reels from seventy until they touch thirty yards only, still retaining the hundred-yards label. In this manner

a good name is "run to death." Then a fresh one is selected, and brought into discredit in a similar manner.

Of old there used to be five hundred pins in a packet: now there are often only two hundred. Articles marked "worsted," again, often have 95 per cent. of cotton in them. The loss, it must be observed, always falls on the ultimate purchaser, as many of the articles cannot be unwound to be measured without being spoilt.

We can understand a petty tradesman perpetrating these contemptible frauds; but what shall we think of the integrity of British merchants, when we find that it is not at all an uncommon thing for them to send up to the manufacturers labels imitating those used by excellent makers, and stipulating that they shall be affixed to inferior goods of other makers? The Merchandise Marks Bill is aimed at this organized system of frauds perpetrated on our wives and daughters.

We may not be very deeply moved at the ladies being cleanly shaved, but the male Briton will not fail to feel indignant at the frauds perpetrated on his bitter beer. It will possibly be new to the public that Bass does not bottle his own ale, but sells it in barrels, and supplies his customers with a sufficient number of labels marked with his trade mark (a red triangle) for the quantity of bottles which the cask will fill. So far, good; but these labelled bottles henceforth become the vehicles for a series of frauds. The publican round the corner, who supplies

you, good reader, with your daily pint of Bass, stipulates for the return of the empty bottles, that he may fill them again with salted, sugared, filthy Burton; and again and again it is done, as long as the famous "red triangle" will keep decently clean upon the bottles. This is a matter which touches the thirsty Briton, and he should see to it. Mr. Bass evidently is unwittingly lending himself to a most detestable cheat. Imagine, good reader, the basket from Bunkum & Pott's at your next picnic duly unpacked by the river-side in the charming month of June, and the tumblers held out by thirsty souls to John in attendance, only to receive, instead of the charming, sparkling pale ale, sweet and clammy public-house beer! Would transportation be sufficient punishment for the rascal who had done that thing? It seems to us that if the labels were pasted over the cork, instead of on the bottles, and if the forging of this label were made a misdemeanour, punishable with imprisonment, as the Merchandise Marks Bill proposes, we might still rest in security as to the integrity of our Bass. As it is, even your black servant in India knows that he can get more for an empty labelled bottle than for a plain one, and thus the swindle circulates round the world.

If we turn to arms, again, we find fraud pursuing us. Mr. Westley Richards complains that common rifles are stamped with his name, and sent into the market as genuine articles; and but too often the purchaser gets his hand blown off. It is always the English gentleman who has to pay the penalty of the

fraud. We recommend this particular instance, therefore, to the attention of the sporting members of the House of Commons, and it will doubtless go some way towards obtaining their hearty concurrence in a measure which will put down a growing system of fraud which is sapping the integrity of the working and mercantile classes of the country.

ADVICE BY A RETIRED PHYSICIAN.



When Rowland Hill invented the penny postage-stamp, and put in circulation the smallest paper-money in existence, he little thought the evil uses to which his admirable idea would be turned. He little anticipated that ingenious gentlemen, who roam about seeking whom they may devour, would, through its agency, manage to live upon the public in princely style, their whole stock-in-trade being an advertisement in the paper! In an article published some time since we drew attention to the alluring advertisement of "A Retired Clergyman" who was anxious to make the public acquainted with a recipe for nervous disorders — the trifling sum of six postage-stamps being all he asked in return for his invaluable advice. But now the retired clergyman gives place to an aged figure, such as we used to see in the frontispiece of didactic volumes of a quarter of a century since in the form of a venerable hermit dispensing to youth the health-giving mountain herb, as thus—

A RETIRED .PHYSICIAN, whose sands of life have nearly run out, discovered, while in the East Indies, a Certain Cure for Consumption, Asthma, Bronchitis, Coughs, Colds, and general debility. The remedy was discovered by him when his only child,

a daughter, was given up to die. He had heard much of the wonderful restorative and healing qualities of preparations made from the East Indian Hemp, and the thought occurred to him that he might make a remedy for his child. He studied hard, and succeeded in realizing his wishes. His child was cured, and is now alive and well. He has since administered the wonderful remedy to thousands of sufferers in all parts of the world, and he has never failed in making them completely healthy and happy. Wishing to do as much good as possible, he will send to such of his afflicted fellow-beings as request it, this Recipe, with full and explicit directions for making it up and successfully using it. He requires each applicant to enclose him six stamps — one to be returned as postage on the recipe, and the remainder to be applied to the payment of this advertisement.—Address, &c.

Charming picture! Admirable devotion of a green old age to the miseries (and postage-stamps) of a suffering public! This sage, whose "sands of life have nearly run out," and who studied hard to save his child, and happily succeeded through the instrumentality of Indian hemp, should by no means hide his light under a bushel—the whole race of poor afflicted creatures, consumptive, asthmatic, bronchitic, and generally debilitated, have only to apply by letter at once to his mossy cell in that health-giving neighbourhood, —— Street, Strand, and so they will be cured. Behold, every morning this advertisement flies, on the wings of the press, to the firesides of hundreds of thousands of our countrymen, whose Arcadian simplicity with respect to quack medicines is too deep to fathom: over this simple crew this venerable old fisher of men casts his net—and what is the daily result? Watch the postman drop his bag at the door of the "Retired Physician." Can there be

more than one letter for the aged recluse? Is the man whose "sands of life are nearly run" troubled with a plentiful correspondence? There are hundreds of letters, and every letter comes laden with its due complement of postage-stamps. The receipts of this aged individual from this source are known to average £10 per day; and this is not the whole of the contribution of the public to this deeply interesting individual. The receipt for the preparation of Indian hemp is duly sent; but, as in the case of the "Retired Clergyman," the recipient, not being able to make anything of it, adopts the accompanying suggestion to send it for concoction to a certain quarter: here the second fleecing process begins; and where it ends we scarcely like to say. We are informed that the aged physician, whose "sands of life are nearly run," is a hale and hearty American, who proposes to open another health-giving fount in the French capital, now that he finds himself firmly established with a princely income in the metropolis.

Thus the world wags. Scores of well-educated medical men are at this moment reduced to starvation-point, and one quack is wallowing in wealth. Is it not infamous that respectable papers should give insertion to such an advertisement? Can any person be deceived as to its character? Can there be a doubt that it is intended to defraud? How, then, we ask, is it possible that honest men can consent day by day to put such palpably fraudulent announcements into circulation? The public health we make such a stir about is as the fat pasture-ground on which design-

ing quacks feed without let or hindrance—nay, with the approval of the Government, and often with the support of the Judges.

If the person calling himself a "Retired Physician" were to kill any of his dupes by his doses of Indian hemp, was in consequence put upon his trial, are not all the chances in favour of the judge recommending his acquittal in consequence of his ignorance? It is really monstrous that the most deadly poisons should be prescribed wholesale, through the medium of advertisements, by persons without any legal title to do so. We question if there are half a dozen physicians in London who can boast so large an income as this "Retired Physician," whose whole knowledge and stock-in-trade is summed up in a cunningly-written advertisement. The proper punishment for this gentleman, whose "sands of life are nearly run," would be a sound outward application of good English hemp to his own person.

SUPERSTITION: WHERE DOES IT END?

A TOWN-BRED man can scarcely credit the fact that "a wise man" dwells in nearly every village, and that witches and wizards are still, in the belief of the country folk, as plentiful as blackberries. The letters which appeared from day to day in the *Times*, a few years back, describing the bewitching of farm stock, the carrying off of wives through the air on broomsticks by the agents of the Prince of Darkness, and a thousand other vagaries of this nature, startled the reader, and seemed as much out of place beside ordinary humdrum ideas, as a piece of old tapestry would beside the silks and tabarets of our drawing-rooms. Those who know the country are startled by no such revelations: the peasant-mind, they are well aware, is not much advanced from the condition it was during the Middle Ages; and, for all we can see, certain classes of great towns are not a whit more advanced than is poor Hodge. Looking over our commonplace book the other day, we came on a notable instance of this in the shape of a newspaper cutting containing an application made at the Worship Street Police Office, when "a lady-like

woman, dressed in mourning," appeared before Mr. D'Eyncourt, the sitting magistrate, and charged Sarah Macdonald, a middle-aged woman, living in Bethnal Green, with obtaining various sums of money from her, for pretending to take away "a spell that had been put upon her."

In the course of the examination, the Magistrate very naturally asked why she went to her at all, when the following dialogue took place, which must be rather startling to those who believe in the march of intellect:—

Witness.—Why, sir, she lays out the cards, and, indeed, is very clever with them. I had heard that she was clever in that way before; but I had not found that she had the power of relieving persons from torment by burning powders till then.

Mr. D'Eyncourt.—Why, what was the matter with you?

Witness.—Why, sir, I had such frightful pains, all cutting, shooting, pricking, and darting through my head and body.

Mr. D'Eyncourt.—Why did you not go to some medical gentleman about the pains you speak of?

Witness.—I did, sir; I was under Dr. Ramsbottom, and I asked him if he did not think they were caused by a spell, and he said no, he thought not. He gave me some medicine, and for some time I got better; but I afterwards became worse from the prickings, and then, as I told you, I went to Mrs. Macdonald, She said, "You appear very ill;" and I told her that I was. We had some conversation about it, and she then told me that a person was doing me an injury, and said, "If you have some of my powders, they will relieve you; but they are sixpence apiece." I told her, of course, that I did not mind that, and she therefore burned ten of them.

Mr. D'Eyncourt.—Then she did not give them to you to take home?

Witness.—Oh, no, of course not. She put them into the fire before my face, and they all cracked, blazed, burned, and bounced.

Mr. D'EYNCOURT.—What object did she say they were intended to effect?

Witness.—Oh, she said they would torment the person who was injuring me.

Mr. SAFFORD, the Clerk.—And did you feel any better from the powders being administered in that way?

Witness.—Oh, yes, I did feel better; but, mind, I don't believe that it lies so much in the powders as in the words she uses. I think it's what she says when she burns them that does you good.

Mr. D'EYNCOURT.—Indeed! then, what were the words she said?

Witness.—Oh, I don't know; she took care that I should not hear those, or, of course, I should be as wise as herself. She did not even mutter them.

Mr. SAFFORD.—Then, there was no incantation?

Witness.—Why, no.

Mr. D'EYNCOURT.—Well, then, have you brought her here because you feel better, or what?

Witness.—Oh, no; I feel worse again—worse every day. I only felt better the first time I went. The fact is, that I have a relative who is coming into a large property, and she wants to get rid of me; so she goes to Mrs. Macdonald and has powders the same as I do, and, of course, they torment me whenever Mrs. Macdonald burns them for her. She knows that's true, too; for when I went another time, she told me that the knowledge got made her so ill, that she was obliged to leave her husband's side in the middle of the night, and burn a powder, to get rid of the torments that she herself suffered from it.

Mr. SAFFORD—And how often did you go to her?

Witness.—Oh, seven or eight times, I should think.

It may be imagined that this precious exhibition of superstitious feeling, which some people believed passed away with the age of Elizabeth and James I., is to be ascribed to the weak nerves of a poor old lady; but, singular to state, the same story was told by the daughter, a buxom young girl of eighteen, who, like her mother, used to indulge in her shilling's-

worth now and then, to take away her "spells," and who equally believed with her mother in the witch's power to avert them, but doubted her will to do so. The Magistrate—no doubt with some signs of astonishment in his face—inquired of the officer if there were many persons who believed in the prisoner's powers, and received the significant reply, "There are a great number, sir, who believe this;" and the prisoner, deprecating her own powers, added, "They believe that I can bewitch the dead, but I can't."

Now, here is a pretty dish to set before those enthusiasts who prate about the spread of universal intelligence, and believe Comus has long since dashed to pieces his crystal glass and thrown away his wand, at the awful call of national schools, penny papers, and mechanics' institute lectures! It will, no doubt, be said that these things occur in the lower ranks of life, and that we should not measure the gullibility of the age by the belief of coppersmiths' wives living in Bethnal Green or Stepney. But have we a right to smile thus patronizingly at the follies of the lower classes? Have not the pages of the public press teemed with the advertisements of persons who profess to delineate the character by merely looking at the handwriting of their dupe? Are not people told that, for twelve postage-stamps and a specimen of their caligraphy, a sketch of their future fate will be returned? Is not "Napoleon's Book of Fate" sold in this country by hundreds of thousands? Our middle classes may not absolutely believe that spells

can be put upon them, like this poor woman; but the belief in the mysterious, however absurd, is more rampant than most people dare acknowledge. Table-turning and spirit-rapping have not yet disappeared before the stern rebuke of Professor Faraday; and, for all we know, there are scores of clergymen who still believe, with the sage priest of Bath, that by these means the devil seeks to corrupt us.

But let us ask, has not this belief in the burning of a powder something very analogous to another belief that is chiefly to be found in the highest places? The wife of the Stepney coppersmith tells us that "she did feel better" for the burning of those powders, which were admitted to be composed of common salt; and have we a right to laugh at her, when "my lady" who resides in Grosvenor Square, and has had the advantage of the first masters in all the languages and ologies, declares that she has been cured of a complaint, which defied the treatment of a score of doctors of the old school, by the simple exhibition of the decillionth of a grain of lobelia? The poor woman who threw the powder of salt into the fire, no doubt did her patient quite as much good under the circumstances as the fashionable homœopathic doctor would have done; for the learned doctor, like the Bethnal Green witch, depends upon the profound credulity of human nature. But the latter is the petted of a hundred good families, and lives on the fat of the land; the other is liable, when found out, to be committed to jail for six months! Can educated men forget, without mingled shame and indignation,

that the breath of fashion has not yet grown cold upon table-turning and spirit-rapping? Can the class which prides itself upon being the best-educated portion of the community obliterate the fact that two of their body, highly respected among their respective flocks, printed and published pamphlets, in which they endeavoured to prove that the devil actually possessed *tables*, and gave responses to the questions of any idle rapper, with the purpose, of course, of destroying immortal souls?

But the contagion does not stop even at the footsteps of the Throne. We all remember the bit of scandal—which, after all, was only too true—touching the superstitious belief of the Empress Eugenie. She was said to have been so profoundly moved by the manipulations of Mr. Home (who, it was asserted, had the power of showing distant events and persons in a large mirror), that the Emperor banished him from the capital. We very much wondered at the time that the magic mirror never made its appearance in this metropolis. The idea was far too good to be lost upon persons who cater for those having an appetite for the supernatural; and after the lapse of a few years it turns up again, but this time in the shape of a crystal sphere, and now Zadkiel the Prophet is its possessor. There is a set of people in this country who constitute what is called "society." To be "in society" you must be somebody; and among the great somebodies this new ball of human credulity was set a rolling. It is said to have formerly belonged to Lady Blessington; and Zadkiel, always on the look-

out for stuffed crocodiles, witches' fingers, and such "fixings" as became the study of an astrologer, eagerly snapped it up. Have we not all blushed to hear how bishops, archdeacons, canons, marchionesses, and ladies of title without end, invited Zadkiel to call upon them with his magic ball, and tell them what was being done thousands of miles away, what would be done thousands of years to come, and what was done anywhere or any time ago? Those fine ladies and gentlemen "moving in society" pretended to invite the astrologer to show his crystal sphere only as a scientific curiosity; but this explanation imposed upon no one, and the country indulged for a moment in a spasm of wonder at the discovery of this belief in the supernatural on the part of the aristocracy.

Well may the philosopher, peeping from the loop-holes of retreat, inquire what advantages the favoured of the land possess over the simple peasant, and scornfully ask if station, birth, and opportunities are of no more avail than to plunge their possessors into a darkness only different in kind to that which possesses the clodhoppers of the fields. The lady who believes that some spiritual essence, beyond earthly comprehension, streams at the ends of the languishing young curate's fingers, as he makes his mesmeric passes, would laugh immoderately at the idea that old Gammer Gurton could "make the colt go home," or that she could track, with a fiery dog, the object of her dislike. Yet, what is there more absurd in the one belief than in the other? Why should we con-

demn Betty Smith because she pretended that she had seen Old Dame Switchem talking to her familiars in the shape of mice (*vide Times*), whilst we have nothing but interest and sympathy for a crowned head, who pretends—or at least whose hysterical folly leads her to believe—that the future is to her unveiled, and that she can look into futurity through the instrumentality of a magic mirror?—or for high-bred ladies who would hide their superstition, when it is made known to all the world, under the specious pretence of mere scientific curiosity?

Truly, if we try the social scale from top to bottom, we shall find that the love of the marvellous is confined to no degree or station of life. If we may claim any exemption at all, it must be for scientific men. It is rarely that we find that those well but not exclusively versed in the physical sciences fall dupes to the enormous impostures which we see every day prostrating the ill-trained intellects of fashionable society. Before the simple scientific rebuke of Faraday, table-turning fell dead at once. In every circle we find a scientific man, and that scientific man generally, raising his voice against every new delusion which, like swallows at the coming of spring, seem to be thronging of late years upon us.

The conclusion we draw from this fact is, that, in any new scheme of education which may be promulgated for the benefit of the people, and for the especial punishment of quacks of all kinds—witches, spirit-rappers, and magic-mirror workers included,—a large share of physical science should be insisted upon.

It is wonderful how ghosts and spirits of all kinds disappear when tried by any chemical tests, and what a sore trial the inductive philosophy is to all mysticism whatsoever, and especially that feeblest of all mysticism which exerts such an influence over the many feeble brains "moving in society."

THE CLERK OF THE WEATHER.

It is a very common thing to hear the name of the Clerk of the Weather Office taken in vain. That individual has hitherto been a myth, against whom the objurgations of Englishmen have been levelled time out of mind. If a fine day is desired, a jocular appeal is made to the kind interference of this ideal personage; but, as we well know, the joke of to-day becomes the fact of to-morrow; and I have actually seen and conversed with this very myth. If the lounger is on his way to the Abbey, as he gets towards the end of Whitehall, he sees before him, on his left hand, looking down King Street, an overhanging bow window: here is the den or cave of the magician who takes under his care the four winds, and foretells rain or snow with certainty. Do you wish, good reader, to be introduced into this sanctum, which your imagination furnishes with a stuffed alligator, a furnace, a still, and a venerable old man in a fur robe and a conical cap, poring over a large book filled with geometrical drawings—*à la* Zadkiel; if so, prepare for something much more prosaic.

What is this on the door—some abracadabra? No, simply "The Meteorological Office of the Board of Trade." I ask for the Clerk of the Weather; the porter stares, and asks me if I wish to see Admiral Fitzroy? It must be the Flying Dutchman, I inwardly cogitate, and he must be weather-wise by this time. But the necromancers have grown singularly matter-of-fact and unpicturesque. Here are an ordinary office and hall-porters, and ordinary clerks at work as I pass, and ultimately the wind and weather den, or cave, is reached, in which a beneficent Prospero, if he does not conjure up, at least foretells all the winds that blow about our island; and our Prospero is—Admiral Fitzroy.

When we remember the mighty argosies Britain has at sea, the army of sailors that tread the salt ooze, the fearful wrecks that strew our shores, the imagination is excited to ascertain by what means he forewarns and forearms man against such fearful vicissitudes. What is the machinery by which the ship about to sail is suddenly arrested and returned to port? by what occult knowledge is the hardy fisherman forewarned to beach his boat, and to hang up his unused nets to dry? Admiral Fitzroy is no necromancer; but the results he works out are more wonderful than even the Professors of the Black Art have ever offered us. His office and its inner rooms are furnished with nothing terrific to see: there are some self-registering barometers hung side by side, a few Aneroids and thermometers, and some storm-glasses, up which the crystal tree I perceive is rapidly

growing; before him is a rough pencil-sketch of the British Isles, and around them are drawn some circular lines: this is a forecast of the direction of the wind that in all probability will blow in a day or two.

But surely, asks the reader, the mere study of the mercury or the weather-glass in a back room in Parliament Street is not sufficient to tell us where the weather is breeding we are going to have to-morrow? Not exactly. But the Admiral is not the only observer. The Department of which he is the intelligent head has posted watchers all round our seaboard, has supplied them with excellent instruments, and every day gathers in the crop of information they have gleaned from their distant stations. Thus, every day comes by telegraph the news of the condition of the atmosphere along the whole circuit of our shores.

Meteorology is a science that has engaged philosophers for centuries; but it is only since the discovery of the electric telegraph that they have been able to make simultaneously and transmit to head-quarters instantaneously the results of their labours over a wide field of observation. Since this has been done, immense strides have been made, and it is rapidly becoming an exact science. This system was first commenced by the Meteorological Department of the Board of Trade, in Sept., 1860. Thus the nation of shopkeepers has been the first to lead the world in a new and most important applied science, which must ultimately save the lives of thousands of sailors and

boundless wealth to the merchants. The observers at the out-stations, which are all situated at seaports of the British Island, are the telegraph clerks — a very intelligent set of men. The Board of Trade furnishes them with every requisite meteorological instrument, and provides a manual of instruction for their use. In this manner a staff of skilled observers are being drilled in all our important seafaring places. They are instructed to send reports to the central office in Parliament Street twice a day, at 8 A.M. and 3 P.M., and oftener when any great disturbance of their instruments warrants special notifications to Admiral Fitzroy. These telegrams give in symbolic figures the condition of the barometer and thermometer, wet and dry; the direction of the wind; the force of the wind; the amount of cloud; the character of weather, and the sea disturbance. Thus the chief is supplied, in a compact form, with all the leading features of the sum he has to work. When all the telegrams for the day have arrived, the various corrections for local peculiarities are made, and the condition of the weather is forecast.

As the knowledge of circular storms is being gradually perfected, the value of this daily sum worked at head-quarters is becoming of the last importance. It is now known that all great hurricanes move in cyclones or ovals in northern latitudes, giving circling winds from left to right, but moving bodily from the south-west towards the north-east. These cyclones are of all sizes, and they move at a rate sufficiently slow to enable warnings of their

approach to be given to out-ports some time beforehand. The first well-noted cyclone was that known as the Royal Charter storm. This hurricane commenced in the south-west, about the Bay of Biscay, and finally passed off along the coast of Norway, sweeping on its way across this island, and visiting the west, south, east, and northern coast with gales which boxed the compass within twenty-four hours. The passage of this great storm has been most accurately mapped, and its whole course in every particular worked out in the most perfect manner, by Admiral Fitzroy and his staff of observers. We may here remark that although these cyclones are often of very limited area, yet they are due to atmospheric influences possibly thousands of miles away. In the same manner the minute eddies of wind which twist about the autumn leaves or dust in our path may be, and are very often, the result of opposing winds directed by distant hills or other elevations. The eddies in the stream which we note whirling down a river have been brought about by the piers of the bridge creating diverse currents. The present system of warning our out-ports was not established in October, 1859, otherwise that noble ship the *Royal Charter* could have been warned of the approach of the great circle of wind at least twenty hours before it swept round upon her, as she lay at her fatal place of anchorage on a lee shore; and probably she would have put to sea and been saved.

Our knowledge that all great winds are circular accounts for a phenomenon that puzzled our fathers—

namely, that a southerly wind is often very cold. The explanation is, that although the wind may reach us from the south, yet it is in reality a polar wind curved round, or diverted from its course by opposing currents of air or other causes.

But to return to our subject: the telegraphic meteorological communications of common and peaceful conditions of the atmosphere are merely recorded at the head office in order to enable the forecast of the weather to be made. This is published every morning in the *Times* and other papers. It is rather extraordinary that the public have taken such little notice of this the only truly scientific contribution to our morning papers. It cannot be that those reports have proved untrustworthy, for, as a rule, our Clerk of the Weather gives in the most unerring manner all the great changes that are about to happen in the coming three days.

It is quite clear that to a very large part of our population a daily approximation even to the coming meteorological changes is of the utmost importance. Let us take the agriculturist, for instance. What a saving it would be to the farmer if he could be forewarned of the approach of a week of wet or of frost! The same may be said of all out-of-door trades. Weather affects all of us, from the landowner down to the costermonger.

Let us reflect for a moment on the widespread misery that falls upon the poor by even one week of hard and continual frost. Yet, day by day, the pos-

sibility of being surprised by the Ice King is becoming more and more inexcusable as the science of meteorology, as expressed in these weather-tables, progresses. It is true that the inland districts cannot, with the same certainty, be forewarned from the central office of the changes that are likely to take place in the weather as the seaboard can, for the reason that the irregularities of the land modify the general rules that are gathered from the level ocean surface; but all the great changes affect land and sea alike, and local peculiarities can be judged by keeping an eye to the local barometers, &c. As the science of meteorology progresses, we feel confident that the forecasts of the weather supplied by Admiral Fitzroy to the public papers will be watched as carefully by all persons dependent upon the condition of the atmosphere as they are by the mariner at this moment. As our seafaring population are not in the habit of reading the morning papers, a special method of notifying to them "squalls ahead" is adopted. Thus, a system of signals for use by night and day has been adopted, and is now in operation in all our principal seaports.

The form of the signal refers to the direction of the expected wind: thus, the cone with its apex uppermost refers to a north wind, and the reverse to a southern one, the simple drum alone, or square, gives warning that dangerous winds may be expected from opposite quarters, whilst the combination of the drum and cone predicts dangerous winds coming at first

from the quarter indicated by the position of the cone.

These signals are of large size, and are hoisted by the telegraph clerks in view of the seafaring community. It is not intended that these signals shall be hoisted except in great and dangerous disturbances of the atmosphere, as the central office does not attempt to give notice of local changes, however sudden and dangerous. These should be noted locally, and it is hoped that observers on the spot will be able to supply this intelligence to the seafaring community. As only the larger outports can be thus warned from the London office, the coastguard is requested to diffuse the intelligence they forward along the coast. These signals are intended for day

WARNING SIGNALS.

FOR DAY USE.



Gale probably from the northward.



Gale probably from the southward.



Dangerous winds may be expected from nearly opposite quarters successively.



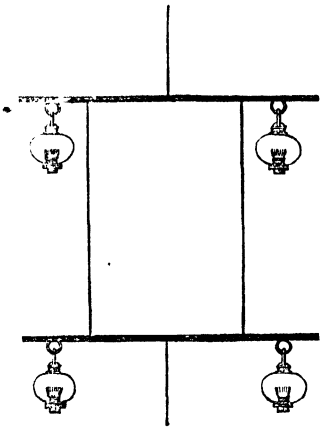
Dangerous wind probably at first from the northward.



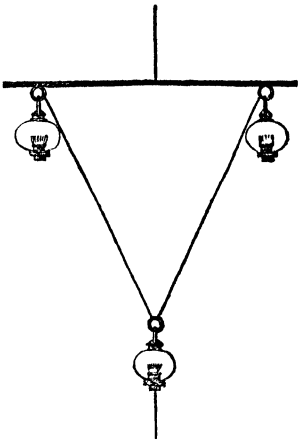
Dangerous wind probably at first from the southward.

use; a separate system of Night Signals is adopted, which are made visible by lamps as follows:—

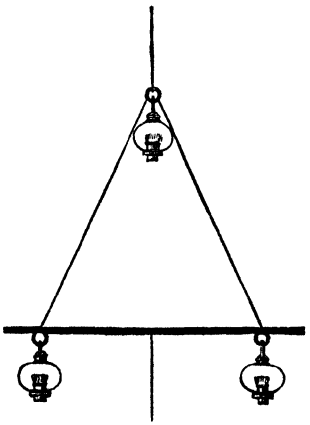
FOR NIGHT USE.



Gales successively.



Gale probably from the southward.



Gale probably from the northward.

These signals are hoisted from dusk to midnight, if necessary. As yet these warnings are intended mainly for seamen on land; but it is to be hoped that our lighthouses will, by and bye, partake in the useful duty of warning passing ships, not only of the permanent dangers of the hidden rock or sandbank, but also of the coming danger of the hurricane. At the present moment this would be impossible, as we have no electric communication with our lighthouses; but as our beacons are, for the most part, stationed on exposed points of the coast, and in mid-channel, they would be of immense value both in gathering meteorological observations for the central office, and in diffusing its danger-signals. The Astronomer-Royal wishes to have the electric spark laid on to these lighthouses for the purpose of giving "time" to captains. Admiral Fitzroy would also desire it, we doubt not, for the sake of forewarning them of storms.

It will be asked, however, has this system of warning our sailors of the approach of bad weather been put in practice effectively? Yes: every storm of any importance has been thus notified to our maritime population; and as the predictions have always been verified by subsequent bad weather, our sailors are beginning to place very great confidence in the system. To the less affluent fishing-villages with which there is no telegraphic communication the Meteorological Department lends barometers and thermometers of a character suited to the habits of the people. These are generally hung in some exposed position, and the people are taught to read and

interpret them — a matter in which even otherwise well-educated persons are apt to find themselves at sea. For instance, it is a general belief that a rising barometer and a falling thermometer indicate fine weather; but the fact is, that when the rise is at all sudden, it rather indicates the approach of a Polar gale, or a gale blowing from the north-west or north-east. The reason is obvious: the Polar or cold air is the heaviest of all the atmospheric currents; hence the pressure it exerts upon the open end of the barometer sends the other end up. Gales from the southern quarter generally give notable warning of their approach by a falling barometer, and a temperature higher than usual for the season. The barometer manual also teaches these men that the approach of a dangerous wind is always indicated by any sudden fall of magnitude in that instrument, or the fall, say for three hours, of the mercury at the rate of a tenth of an inch per hour; and also that the longer the signs of change of weather have appeared, the greater chance of the change lasting. Much of weatherwise wisdom is expressed in the old couplet:—

Long foretold long last,
Short notice soon past.

The fall of the mercury in the thermometer ten degrees is also a notable sign of a coming hurricane. But it is not the sailor alone that requires instruction in the use of the barometer: there is scarcely one person in a hundred who hangs up a barometer in his hall who can read it properly. It will generally be

found that it is hung too high. The vision should be on a level with the top of the mercurial column, as it is according to what that fluid is doing at the moment of observation that good forecasts can be made of what is to come. Thus the condition of the surface of the mercury is especially noteworthy: when it is rising it is convex, and concave when falling—a symptom very clearly visible in modern barometers and thermometers in which the column of mercury is large. Admiral Fitzroy, in his instructions to observers, is careful not to cut off any source of information, as he especially notes that the indications of Nature are to be watched. Thus, when sea-birds fly out early and far to seaward, fair weather may be anticipated; on the contrary, when they hang about the land or fly inward, stormy weather is indicated. When animals, instead of spreading over their usual range, seek sheltered places, storms may be expected. Dew is an indication of fine weather,—so is fog; but clearness of the atmosphere near the horizon is a sign of wet. When a mountaineer sees the hills cutting sharp against the sky, he wraps his plaid around him. A good hearing day is also an indication of coming wet. The public will feel all the more confidence in the Head of the Meteorological Department for not disdaining these phenomena noted by the weatherwise, as they rest upon exactly the same foundation as what may be termed the more scientific signs—namely, experience.

Now that Meteorology is elevated into an applied science, we feel confident that immense progress will be made. It is a great thing to know that there is a

central department instituted purposely to collect all information bearing upon the subject, and that it has a chief like Admiral Fitzroy, whose heart is in his business, and who seems never better pleased than when he is collecting from any source, however insignificant, a fact that is noteworthy — unless it be when he is diffusing his knowledge so attained either to individuals or the public at large. The growth of this new department seems to bear the same relation to the Shipwreck Relief Society and the Lifeboat Society that preventive medicine does to remedial medicine. Indeed, as we progress in knowledge we are beginning to find out that prevention is better than cure; and, what is more to the purpose, we are becoming enabled to put this prevention in practice.

THE NEW COUNTERBLAST TO TOBACCO.

THERE is a class of persons who employ themselves with all the energy of despair in raising some cry of alarm, and making everybody about them unnecessarily uncomfortable. They parade their bugaboo with a desperation which ensures a temporary public attention, and as soon as this dies out, they start another of a still more attractive appearance. The Vegetarians would reduce mankind to live upon sky-blue and an apple, or at best an egg; the Maine law liquor men would legislate all spirituous and malt liquors off the face of the earth; and now we are to have an anti-tobacco-smoking agitation which is to end in the entire demolition of the "Stygian weed." It is quite clear that this restless class of individuals will not "let a body be," and we may think ourselves lucky if hereafter we are not reduced by them to have our diet regulated by Act of Parliament. The anti-tobacco-smoking agitation is the last issue of this very unpleasant brood, and we believe we are indebted to Mr. John Lizars, of Edinburgh, for the hatching, rearing, and sending it forth in a little pamphlet, entitled "Practical Observations on the Use and

Abuse of Tobacco," which has already gone through six editions. Upon taking up this publication the other day, we were certainly not a little surprised at some of the statements therein contained, which are calculated, we must confess, to shake the nerves of all smokers already enervated by the abuse of tobacco. The art of making an immediate and startling impression has, however, its drawbacks. Accuracy of detail and sequential reasoning must be sacrificed to a breadth and startlingness of effect. When the urchin sets up his turnip-ghost in the churchyard, he cares little for the Phidian accuracy of its countenance, so long as its goggle eyes at once prostrate Tommy as he comes round the corner.

This little work of Mr. Lizars is open, we fear, to hostile criticism in this direction, as we shall endeavour to point out. Of course it would not be worth the while of the writer to show that the habit of smoking affects only a few isolated individuals, so he at once elevates it into a great and pregnant cause of the destruction of peoples and empires. "Excessive smoking has had no small share in degenerating Spain," he tell us in the preface to his fourth edition. Portugal and Germany are pretty nearly as bad as Spain; but Turkey is "a gone coon" all along of tobacco-smoke:—

There can be no doubt, from what has occurred in the war just ended, that, had the Turks never indulged in the vicious habit of smoking tobacco, they would not have required the assistance of the Sardinians, French, and British. They would have been as powerful as in the days of the Sultans Othman, Orchan, Amurath the First, and Bajazet; and would have sent such a messa-

through Menschikoff to the Czar Nicholas as the Sultan Bajazet sent to the Count de Nevers of France, when taken prisoner, after his celebrated unsuccessful cavalry charge (like that of Balaclava) near Nicopolis.

Thus the better part of Europe and Asia has sunk from its high estate, chiefly in consequence of this vile weed! When Gibbon toiled and *smoked* and thought over the "Decline and Fall," in his little garden at Lausanne—when he penned the last line of that remarkable work, and looked out upon the calm lake —he little thought how the labours of future historians would be simplified by the discoveries of science. Even his prophetic eye could scarcely have penetrated to the time when the philosopher, instead of looking to the passions of men working through ages as the causes of the decay of peoples, should seek for them in the narrow compass of the pipe he haply smoked! Mr. Lizars is undoubtedly entitled to the thanks of all future slaves of the lamp for so grand a discovery. Nevertheless, we must remind him that nations were just as apt to degenerate in the patriarchal times, before tobacco-smoke was known, as now-a-days.

Tobacco, according to Mr. Lizars, having slain so many nations in the Old World, he anticipates a new victim in the West: at least, he quotes with approval an extract from the *Spectator*, in which the Yankees are described as "undergoing a process of physical and moral degeneracy;" and further, that "the people [illegible] medlars—rotten before they are ripe"—prin- [illegible] consequence of "smoking and chewing [illegible]." Now, we always imagined that

the defect of the Anglo-American character was an extravagant go-aheadism—an uncontrollable energy which would stop at nothing. If this effect is caused by tobacco-smoking, we should like to be informed by Mr. Lizars how the same weed can have the effect of steeping the Turk in apathy and idleness! The narcotic must be affected by longitude in some very remarkable manner, which we should like to hear explained.

Mr. Lizars having desolated and overthrown empires with a whiff of smoke in this remarkable manner, we expected to find a fitting figure for his grim landscape. Here he is—a monster such as Frankenstein never could have imagined:—

I once travelled with a gentleman from South America, who first filled his nostrils with snuff, which he prevented from falling out by stuffing shag tobacco after it, and this he termed "plugging;" then put in each cheek a coil of pigtail tobacco, which he named "quidding,"—in this country called "chewing;" lastly, he lit a Havannah cigar, which he put into his mouth—and thus smoked and chewed, puffing at one time the smoke of the cigar, and at another time squirting the juice from his mouth, as so graphically described by Dickens in the boat story, on its way to the Far West. This gentleman was as thin as a razor, with an olive-coloured countenance, and frightfully nervous.

What a creature! Imagine shag tobacco hanging from his nostrils as long as the King of Sardinia's moustaches! But this, the reader will say, is simply an allowable exaggeration, in keeping with the previous picture. Not a bit of it. Here are his own consecutive remarks upon it:—

The preceding is neither a caricature nor an exaggerated account of the fearful extent to which the use of tobacco is carried, not

only in Europe, as we know, but, as there is every reason to fear, in every quarter of the globe where it either grows or is unhappily conveyed.

Pray remember, good readers, Mr. Lizars deliberately affirms that *the picture is neither a caricature nor an exaggerated account!*

So much for the accuracy of Mr. Lizars' descriptions as a philanthropist. They are somewhat inconsequential and over-coloured, it must be admitted; but still, when gentlemen deal with large problems out of their own direct line, allowances may be made for them. But let us now listen to what he says with respect to tobacco as a direct agent in propagating disgusting surgical diseases:—

The practice is by no means uncommon, in some ranks of life, for two individuals to smoke the same pipe or cigar alternately, the one taking a puff or *draw* after the other; and in this way the morbid poison produces a similar effect to what is exemplified in the communication of yaws or sibbens, by drinking out of an infected cup or vessel. I have often been consulted by gentlemen having marked ulcerated throat, which they could not account for. On interrogating them, they have admitted lighting a pipe used by another, or having accepted of a puff of a friend's cigar.

Labouring men may pass round the cutty pipe, but we never heard of gentlemen smoking a cigar alternately. However, we will take Mr. Lizars' word for it that some people are dirty enough to do so, and that contagion is thus passed on with it. What does this prove, however? That tobacco is therefore pernicious? Certainly not. He might as well, on the same plea, object to drinking-glasses. Tobacco not only inoculates the blood with a deadly poison,

but it is, according to Mr. Lizars, the cause of carcinoma in the tongue! some horrible examples of which he gives in the book before us in excessively highly coloured plates.

I have received several communications from professional friends, strongly indicating the strength and extent of medical testimony against the use of the poisonous weed, and out of these I have selected one sent to me by a physician who has long enjoyed extensive opportunities of witnessing the very prejudicial effects which tobacco-smoking exercises on the digestive organs. "In the course of my professional experience," he writes me, "two or three cases of decided carcinoma of the under-lip, all of which terminated fatally, have come under my care, and which could be unmistakeably traced to a sore, occasioned by a burn from a hot cutty pipe."

Now this extract from the friend's pen may be translated to mean nothing more than what has long been suspected but never proved—namely, that the sore created by the corrosive action of a tobacco-pipe may act as an exciting cause in producing epithelial cancer in a person so predisposed. Even here tobacco is only an accidental offender; but at page 14 Mr. Lizars, in commenting upon a case of cancer which had so arisen, would seem to set the weed up as the *cause* of cancer:—

Here I may remark, how many narrow escapes of having cancer of the tongue must *every smoker* have had, when we consider that every one with a disordered stomach has had one or more pimples on his tongue, which, had they been irritated with pungent tobacco-smoke, as in Dr. B——'s case, would in all probability have ended in ulceration, becoming cancerous, and ending fatally.

Does Mr. Lizars mean to aver that cancer may be induced in *every* smoker who happens to have a

pimple on his tongue, which the pungent tobacco-smoke irritates? If this is his position, our inquiries into the causes of carcinoma have received an immense impetus. We fear, however, that our author means no such thing. No other interpretation can be put upon his words, however; and we therefore draw attention to the statement, in order that it may be either disavowed or more deliberately affirmed. We are far from saying that tobacco-smoking is at all times a wholesome habit, or one that can be indulged in with impunity by every individual. That it has an injurious effect upon the nervous systems of individuals out of health, and on those of a particular idiosyncrasy, there can be little doubt; but so also has tea. Indeed, we believe that green tea, universally adulterated as it is, has much more to answer for, in producing nervousness than tobacco. Be that as it may, however, what we wish to insist upon is, that glaring exaggerations will never serve the truth; and we feel convinced that not one cigar the less will be smoked in consequence of the highly coloured statements of Mr. Lizars, to whom we would apply his own phrase with respect to tobacco, only a little altered—*Throw away exaggeration for ever.*

Mr. Solly, who is the chief leader of the anti-tobacco party, has certainly this great advantage over Mr. Lizars—he argues temperately, and does not deal in those gross exaggerations which, as we pointed out a short time since, render the opinions of the Edinburgh surgeon worthless and mischievous. We must confess, however, that Mr. Solly has not put forth any

facts which are indisputable with respect to the ill effects of the moderate use of tobacco. We are quite willing to grant that the immoderate use of smoking is exceedingly prejudicial to the young, but what earthly good is not open to the same objection? Are we justified in preaching a crusade against religion because in some minds it degenerates into fanaticism? Must we abjure wine because some blackguard sots, and beats his wife? We ask these questions because we believe that these solemn leagues and covenants against "creature comforts" of all kinds are symptoms of a disorder which characterizes the age. Surely the Almighty gave us reason in order that we may use it—that we may be able to rely upon our judgment and say, "Now I have had enough." If we are to taboo everything which may prove injurious if carried to excess, we shall end in isolating man from every good that God has given him. And let us add, that in attempting to do so much in the tabooing system, we are, in our opinion, [illegible] the human mind; for what becomes of our self-reliance, if we lock up the will at every conceivable avenue, and stir no foot for fear of stumbling?

If tobacco is really prejudicial to the human constitution, taken, as most men take it, moderately, we shall be glad to see its use wholly abolished; but we find no proof of the fact is forthcoming. Most certainly, as yet we have seen no tittle of evidence to that effect. We have read an infinity of letters upon the subject in the *Lancet*, but we must confess they contain nothing but the personal impressions of their

writers, and that, if the weight of these airy nothings were pitted against each other, the moderate smokers have the advantage. Mr. Solly appears to see this difficulty; and in his attempt to escape it he appeals to wider fields of experience. He asserts that "high intellectual activity" is interfered with by the habit of smoking; and he rather inaptly seeks to prove his position by stating that Lord Raglan and Sir Charles Napier gave up smoking as soon as they entered upon their respective commands in the late war! We fear the tobacco-smokers will say, "that was the reason they made such a mess of it—had they gone on smoking, they would have been more successful." Be that as it may, however, we think Mr. Solly's appeal to the manes of the illustrious dead is rather unfortunate; for, if our memory serves us, the great intellects of the past were notorious smokers—to wit, Raleigh, Newton, Hobbes, Locke, Milton, Byron, Coleridge, Charles Lamb (see his ode to Tobacco), Moore, Shelley, Scott, Robert Hall, Burns. These are only a few that come to mind at this moment, but they certainly contain the cream of the human intellect of the last three centuries in England. Among living great men who smoke habitually, are Tennyson, Guizot, and Louis Napoleon. If we look abroad, the smokers are equally in the ascendant; in large-brained Germany all the philosophers, past and present, with Gœthe at their head, were and are smokers.

After this evidence, we think Mr. Solly must considerably modify his statement that smoking is incom-

patible with a high state of intellectual activity. We do not think, however, that the defence of a moderate use of tobacco rests upon the support of even these gigantic exemplars of the human mind: it has a far surer foundation in the universality of its use. Surely a substance which is used almost as commonly as food itself—which finds equal favour in the hut of the savage and the homes of the first cities in the world—must be something more than a mere vulgar mistake, a noxious blunder, which has only to be exposed to be abolished. It must be *en rapport* with man's nature itself to have spread even farther than the use of wine. Let our controversialists consider this fact in its broad and ineffaceable meaning, and we do not fear that they will pooh-pooh it as unworthy of being considered, as Mr. Solly does.

Mr. Solly asks if our psychologists or mental physicians cannot give us some account of the average number of lunatics who have been habitual smokers. Is this eminent surgeon, who has devoted himself to brain diseases all his life, unaware that tobacco is, almost without exception, used as a common article of consumption, and as a sedative, in our public and private lunatic-asylums? We select, for instance, the following items from the reports of lunatic-asylums on our own table:—Colney Hatch: tobacco and snuff for one year, £271. 2*s.*; North and East Riding Lunatic Asylum: tobacco, 210lb., £36. 15*s.*; snuff, 8lb., £1. 17*s.*; Wilts County Asylum: tobacco, 227¾lb., £37. 10*s.* 11*d.*; snuff, 37½lb., £6. 12*s.* 8*d.* We may go through the reports of every county asylum in

England and find similar entries. This, if not an exact answer to Mr. Solly's question, at least shows what are the smoking habits of our lunatics. The medical superintendents of our asylums must be prepared to defend this practice against the wholesale denunciations of Messrs. Lizars and Solly; and we call upon them publicly to give "the reason that is in them" for what they do. As far as we have been able to observe, it would appear that excessive smoking is more particularly confined to very young men—a class of persons who are generally apt to run into excesses of all kinds. To such persons the habit is, we believe, injurious, as the nervous system in youth is particularly sensitive. In middle age, we question whether there is such a thing as immoderate smoking to any extent; certainly the habit is not so universal among men of the world as it was in the reign of the first and second Georges, when the pipe and the pot, or the punch-bowl, were the sole solace of the age.

After a certain period of life the human frame seems capable of resisting the influence of any amount of tobacco-smoking. Those who have noticed the habits of very aged people know full well that many of them, especially in the lower ranks, consider the pipe to be the chief enjoyment of life. There was a few years ago an old woman at Swansea, 108 years old, whose cutty pipe was never out of her mouth; and we have remarked that of late most old women who have died at a very advanced age, beyond a hundred years, have retained the habit until the latest moment of their existence. We do not wish to put forward these old

women as any argument in favour of immoderate smoking, as we know the worthlessness of arguing from the special to the general, but simply to show that tobacco, even taken largely, in a certain stage of life, and after the establishment of a habit, becomes quite inert.

*

PORTSMOUTH DOCKYARD.

For the small sum of half a crown you may in the summer season leave hot and dusty London behind you, traverse the South Downs, skirt the South coast, spend a day in the great naval arsenal of Portsmouth, and be back again in town to a late tea: that is, those who like cheap trips and this kind of racing within an inch of their lives may do so if they like—which I do not. Wanting a holiday last summer, and having made inquiries for the least Cockneyfied seaside place within a couple of hours' journey of London, I made up my mind to spend a month at Southsea, to the horror of my respectable friends. And where in the name of fate is Southsea? inquires the reader. Southsea, then, is the west-end of Portsmouth, so to speak, although it really lies to the east of that famous port—so close, in fact, that you may throw a biscuit from the Common almost into the High Street. There are certain places that every Englishman must see in the course of his lifetime, and *the* dockyard—the chief cradle of our fleet—is one of them. And it is not only the cradle but the destined grave of our naval power, as some people will have it; for here we are

told the Frenchmen will some day catch us, and smother us in our naval hive like a swarm of hornets, unless we keep a good look-out. For these reasons Portsmouth Dockyard, just at the present moment, is one of the points on which the national eye is fixed.

There is certainly something very charming in the extreme civility with which the total stranger is treated in our great public establishments. He is made to feel that all the treasures that he sees belong to him,—in common, it is true, with the Queen and a few millions besides, but still to him; and he enjoys all the dignity of proprietorship. Indeed I could not help feeling that I possessed more than my ordinary share of those large 120-gun ships, &c., inasmuch as a six-foot policeman was told off especially for my service in [illegible] all the glories of the premier British arsenal and dockyard.

And first about Masts. Those accustomed to sea-ports and merchantmen only are struck with the imposing magnitude of all the details belonging to our great ships of war. Milton, when he likens Satan's spear to the mast of "some tall admiral," conveys by his similitude only a just idea of its portentous size.

Let us take the mainmast of the *Duke of Wellington*, for instance. Here it lies, stretching its length for many a rood: not a simple spar, for no tree that grows could furnish such a bulk as it presents; but a complex structure, built up of innumerable pieces, with as much care as one of those tall chimney-stacks which carry off the fumes of alkali works, rising to a

height of upwards of 200 feet, and surmounted on the topmost spar with a truck. We shudder when we see a British tar occasionally stand upon this giddy height, out of bravado; but the feat loses somewhat of its merit when we find that this same truck, which looks like a mere speck at the masthead, is in reality as big as a small tea-table.

As one surveys the treasures of the masthouse—sees the spars of the old *Victory*, of the *Duke of Wellington*, the *Victoria*, the *Albert*, and of the scores of other first-rates, that lie side by side, stacked away with as much ease as though they were mere walking-sticks—one feels a certain melancholy impression that they belong to the Past. Never again will these stately masts carry the bulging sail; never again will a fleet of three-deckers put out from our seaports to fight. It is this reflection which gives such an air of sadness to all our naval arsenals. The old fighting ship which towered so majestically over all meaner craft, and which bore some sort of relation, as regards size, to the mighty deep on which it rode, is as much a thing of the past as the *Great Harry* or a Roman galley. When Turner, thirty years ago, painted his touching picture of "The *Fighting Téméraire* towed to her Last Berth" by the little fizzing tugboat, he but too truly foreshadowed the coming fate of the giant race of ships, which seemed, like Ossian's heroes, to grow more vast and majestic as they finally disappeared from the scene.

The revolution that is so silently and surely passing over our naval system seemed to me to have struck

with palsy the yard itself. The ropery, where of old those great cables were spun which held our largest ships at anchor, now finds its chief occupation gone, for iron takes the place of hemp. The smaller ropes are yet spun here; and the immense length of the building in which they are made—upwards of a quarter of a mile in length—becomes apparent to the eye as one sees the men at the extreme end advancing, like so many spiders, and scarcely as large, twisting the hempen line from the flax surrounding their waists, just as the insect seems to draw out its delicate web from its own intestines. We looked in vain, however, for the mighty twenty-five inch cables, and we saw the machinery for twisting the various strands that compose them now standing idle. As a relic of other days, a portion of the great cable of the *Royal George*, sunk at Spithead, hung up in the ropery, is doubtlessly looked upon by the hands as a Saurian is viewed by a geologist, marking the gigantic creations of the elder days. But bulk does not necessarily constitute strength, for iron links, only a third the size, are now in common use, and constitute the safeguard of our fleet. As we look upon these links, however, we are reminded of the magnitude of the trust we place in their soundness; on a single loop of iron the fate of a ship with a thousand men is often dependent as she rides at anchor during the fury of a gale blowing on a lee-shore. A slight flaw, which the eye cannot detect, may be pregnant with the fate of this multitude of men; the integrity of each segment of the iron cables supplied to the

navy is therefore a necessary preliminary to its being issued; and we must give the Government the credit of using every conceivable care in testing their soundness. Every link is subjected to an enormous strain by the application of hydraulic power before it is passed, and thus the instrument of salvation, as well as that of destruction in the shape of the cannon, is thoroughly tried before it is put to practical use. We wish, however, we could say the same of that portion of the men-of-war's holding power which has laid upon it perhaps the greatest strain of all—the anchor. When we gaze upon the accumulation of huge "best bowers" and "sheet-anchors" in the "rack," looking like the whitened ribs of countless elephants, we are reminded of the curse that has always attached to the Admiralty—the curse of sacrificing progress to "the system." The British public have often asked why it is that the British navy is supplied with the old-fashioned and most unscientifically constructed anchors, which have been so often tested and found wanting, in comparison with the patent anchors of Trotman, now used by all our large ships of the mercantile marine; and the answer is characteristic enough of the Department which makes it—"We cannot adopt the new anchor, because the contracts for the old one are not yet out, and will not be for a dozen years." What would the nation say if our artillery engineers had made the same improvident and imbecile contract in the case of guns, and had refused our tried Armstrongs and Whitworths, because they had a contract running

with the Carron Company for the old smooth-bore 68-pounders ?

The point, perhaps, of the greatest attraction, and one which the officials never fail to laud with the utmost extravagance, is the block manufactory, where the blocks, great and small, for the rigging of the British fleet are manufactured. When the machinery for this purpose was first designed by the elder Brunel, in 1801, it was doubtless a very great advance upon the hand labour of the Yard, and probably was viewed with astonishment by the somewhat fossil heads of the dockyard authorities—an astonishment and admiration which seems to have come down to the present time; but it is no offence to the memory of the great engineer who invented it to say that it is now grown very antiquated and altogether behind the time, and is not by any means to be compared with many of the many new processes for saving labour now to be seen in operation either at the small-arm factory at Enfield or at the great arsenal at Woolwich. I would no more have desired to have hinted as much to the six-foot policeman who acted as my cicerone, than I would have given a free opinion on a point of theology to the Archbishop of Canterbury. We are told that the number of blocks in a full-rigged ship is not less than 1,432: this number of course refers to the old three-deckers; but as our modern heavy frigates are rigged in a far simpler manner than those sailed by our fathers, this estimate can no longer be accepted; and what perhaps with our new reefing

apparatus, and our shield ships, the old-fashioned block will ere long be superseded by some new invention.

As we talk of shield ships, we find ourselves beside the dry dock which holds the *Royal Sovereign*—that is to be one day a specimen of the new craft. We can imagine the inventor tearing his hair—if the obstructions thrown in his way by the Department have left him any hair to tear—and exclaiming, "How long—yet how long!" The *Royal Sovereign*, a specimen of a three-decker of 110 guns, built we believe by the late Surveyor of the Admiralty, not only never went to sea, but never even left the dock in which she was built. Two years ago she stood a noble-looking craft, when that wicked man, Captain Coles, forced his ideas upon the "lotos-eaters" at Whitehall, and the word was sent to cut her down. It has been remarked that the dockyard men never seem to work with such a will as when they are pulling to pieces, and in this case in a very short time the mighty frame of this "first-rate" was razed to her water-line. Here, however, all the efforts of the shipwrights seemed paralyzed, and the work of reconstruction has since gone on with the usual Government torpidity.

But can we expect the moving spirits at the Admiralty to be over-anxious that the new kind of war craft should succeed? "My Lords," who have passed their days of service in roomy ships, with fine poop cabins and stern galleries, and in full command of flush decks, on which our Jacks, when work was done,

danced for their own and his delectation, to the music of the merry fiddle, cannot be expected to bear any good will to these iron turtles, the chief merit of which consists in casing up their inmates in walls of iron, that let in light only from overhead (and not too much of that), and absolutely deny a peep at anything but the eternal blue of the sky above. "My Lords" could not be brought willingly to agree to such a living death as this. Moreover, our gallant heroes like to fall in the arms of Victory upon their own quarter-deck; but, according to Captain Coles's scheme, this will be impracticable: at all events, even Nelson could not have died in a dignified manner upon the top of the inverted kitchen candlestick—for such is a Coles patent cupola, to say the best of it. But this is the British admiral's point of view of the new design. Possibly the British public may have a different idea of the matter, and may wonder, as we know it does, after the experience of these cupola ships gained in actual conflict on the other side of the Atlantic, that such disgraceful apathy is shown in putting the new idea to the test in our own waters.

The Docks—of which there are nine in the Portsmouth yard—nearly all speak of the transition state of our marine affairs. With the exception of two, they are all too short for the long frigates, both iron and wood, which have superseded our towering three-deckers. Like growing boys, these new ships have outgrown their docks, and now the latter must have their tucks let out, if we may be allowed to use a

tailor's image. On two of the docks this operation has been performed, and we saw the famous transport *Himalaya* high and dry in one of them, exposing in all her length the beauty of her finely curved lines. The necessity for increasing the dry-dock accommodation in this yard is becoming day by day more apparent, as, since the introduction of the iron-plated frigates, it is found that the bottom-cleaning process is required much more frequently than with wooden ships. Both the *Warrior* and the *Black Prince* have thus fouled in a very short space of time, and no composition has yet been found effectual against the barnacles and the seaweeds which cling to them. A sheathing of copper, unfortunately, cannot be employed in such ships, inasmuch as the salt water, acting upon the two metals when in contact, would produce a galvanic action which would speedily eat away the copper, as in ordinary galvanic troughs. Some bold speculator has startled the "slow coaches" of the dockyards by proposing to supersede the laborious and costly plan of sheathing her Majesty's ships with sheets of copper—6,500 of which, we are informed by the guide-book, are required for the bottom of a first-rate, and these must be fastened on with a ton and a half of counter-sunk nails—by the simple plan of electro-plating them. To accomplish this, the dock would be turned into a large electro-bath, the vessel of wood would simply be blackleaded, a line of wire from stem to stern would be formed to complete the circuit, and in an incredibly short space of time the ship would receive, without further trouble,

a clothing of copper from her water-line downwards without break or flaw. The deposition of iron has never been yet managed successfully by means of the electro-type process: otherwise we may imagine our teak-built frigates thus armed with plates of metal to any required thickness, in a single night, without the weakening process of bolting on! Our great war-ships would then go to battle fully armed in coats of mail, and the act of "closing rivets up" would be quietly and noiselessly performed by the blue spark of Electricity alone.

We have not time to [illegible] the reader through the Smithery, as there really is nothing in all this establishment which differs much from great private shops of the same kind. The Admiralty have lately taken to manufacture their own armour-plates, but we have not heard that they have succeeded in producing better work than, or indeed so good as, the Thames Iron Company and other establishments.

The old *Sultan*, seventy-four, hulk, has for months been used as a target-ship for the trial of these plates, sent by different iron-masters; and the significant attentions of 68-pounders, at 200 yards' range, are visible enough on her sides. Some of her plates are merely dented, others are starred like a sheet of glass; others, again, have been smashed and partly detached from their fastenings. An inspection of the dark hold of the old ship shows most strikingly the effect of the shot upon her timbers. In some places the ball has gone through both sides; in others, huge fractures appear; and the solid oak, in most cases, has

been broken into "match-wood." We do not speak figuratively, but literally; the ship-side, in some places, being so shattered around the shot-holes that it has crumbled to pieces like "touchwood."

On a fine breezy day, a sail up the harbour is the proper addendum to an inspection of the dockyard. If we take a boat at the "hard," that spot beloved by Jews and crimps, and the richest perhaps in public-houses of any like-sized spots in the world, our destination is sure to be suspected to be the old *Victory*. There she lies, together with her companion training-ship the *Britannia*,—two models of the old men-of-war of the days of our grandfathers, "when ships were ships," as the Old Salt remarked who rowed me towards the mighty old hull.

There is something about the build of these old three-deckers that looks more majestic than even larger ships of a later build—the "tumbling-in" of their sides gives a proud, defiant look to them which we miss in the straighter sides of newer models. Compare them, for instance, with the *Duke of Wellington*, or the *Victoria* and the *Albert*, the three leviathans riding at anchor higher up the harbour: each of these fine ships is at least a third larger than Nelson's old ship, but to our eye they do not make such a proud appearance when viewed from a distance. These latter ships are the last efforts of a bygone age: the paint is scarcely dry upon their sides; the masts of the two latter have, if we mistake not, never been shipped, yet they are as completely things of the past as the *Royal Harry*. Their large bulk, instead of

being a source of strength to them, is a cause of weakness. A single shell pitched into their hulls from a mimic gunboat by an Armstrong at a mile's distance would as effectually demolish them as Goliath was demolished by the smooth stone from David's sling. What will they do with these bulky toys, just completed at a cost of a quarter of a million each? Is it their fate to be cut down to the water's edge, like the *Royal Sovereign?* We fear so, for they will never ride the waters like a thing of life again in their present form. It is positively disheartening to sail up the harbour and see ship after ship past and gone ere it has sailed a league. We cannot say, like Beau Brummel's valet, as he carried away an armful of crumpled cravats, "these are our failures;" but we should be glad to know when we have a ship that we can really call a ship, and not a mere helpless target for those horrid guns, which go, bang, bang, from the *Stork* gunboat higher up the harbour; possibly, as we listen, Captain Coles's cupola has been smashed into "a cocked hat" by steel-headed bolts.

"They ain't contented wi' cannon-balls, as they was in my day," remarked the boatman, dolefully; and dolefully we rowed on beneath the shadow of the 131-gun ship, almost doubting if Britannia did indeed rule the waves, and if the broadside threatening above us was only a delusion and a snare. As we passed on, the long, low raking hull of the *Warrior* lay alongside the dockyard wall, looking vixenish and cruel: her gun-ports contracted to the smallest possible size, her

guns of the deadly Armstrong make; no ornament, no open stern galleries, no projecting angles to be knocked about; but a smooth hard nut, very hard, we doubt not, to crack, but to be cracked, as sure as fate, by that dreadful Whitworth, who grimly sits at home making his punches and steel bolts to smash our gallant navy to smithereens.

It is positively a relief to turn away from this head-aching game of attack and defence, to watch those two little brigs of war making out to sea as though we were in the good old days when George the Third was King. They are the *Sealark* and the *Racehorse*—old 10-gun brigs, bowling along with all sails set. These are the training-ships, in which the boys and naval cadets learn seamanship. They start down Channel every Monday morning, and return at the end of the week, and train the young English tar in the way he should go. Let guns beat ships, or ships guns, we may be sure that it is the true British stuff that fights them,—that will give us the lead as heretofore; and as we see the young scamps crowd the rigging and run like cats along the yards, we feel that here at least we are doing the right thing, beyond cavil or dispute.

Not to loiter longer among the melancholy ships laid up in ordinary, dressed in their Quakerish suits of drab, let us pass by the steam-ferry over to the Gosport side, in order to inspect the Gunboat Slip. If anything in England can be like China, we should say that the country in the neighbourhood of the Government establishments very much resembles it. There

are salt-water swamps in any number, with creeks running through oozy mudbanks, and across a small inlet of the sea a bridge, which rises at a pitch that reminds us of the bridge on the "willow pattern" plate. Gloomy and solemn looks the Great Naval Hospital of Haslar on our right hand; but the inmates have a charming view over Spithead and the lovely Isle of Wight beyond, and there is a liberty accorded to the convalescents which may well be copied in other hospitals. If the visitor looks seaward, over the terrace, some fine day, he may probably see an eight-oared cutter moving about. This is the mad-boat of the establishment: the insane are permitted to row, and fish, and sail on their old element, and no harm comes of it.

But the Gunboat Slip? says the reader. Well, the Gunboat Slip is perhaps the oddest place in the whole naval establishment. At first the visitor thinks he is in a railway-station, as on either side long rows of sheds are placed, and between them lines of rails—one line running down into the salt water, with others crossing it at right angles, just in front, and parallel with the long row of sheds, which open end-ways upon the open shore. Peering out from the sheds, on the opposite side, seem to be a goodly company of white owls of Brobdignagian proportions. On inquiry, however, they are found to be only mortar-boats laid up in ordinary. Their hawse-holes, however, look just like eyes, and their cut-waters like beaks, and the whole expression of their bows is wonderfully like that of the night-loving bird.

That longer row of sheds, facing the water and the landing-slip, is divided off into numberless pigeon-holes, out of which peer as ill-tempered a set of gun-boats as well could be got together, if we may judge from the names conspicuously painted on their bows —*Snappers, Growlers, Biters, Vixens, Termagants, Bruisers, Snarlers,* &c., all looking at you out of their houses, just like so many bulldogs in a sporting dog-dealer's yard.

But how do these bulky gunboats perform the feat of getting so comfortably on dry land? There is a huge locomotive, and before you are the rails. The *Griper* steams up to the landing-slip, already fixed in a cradle which runs upon the rails. This cradle is attached to long iron rods, which are hauled inland by means of a powerful screw, and up comes the long black hull, and in a few minutes it is landed like a great whale. Once fairly on shore, she has to be shunted to her appointed shed; this is done by means of the cross-rail; the locomotive, butting at the ship's side, pushes her broadside along, just as elephants are pictured as shoving before them great guns in India. This is certainly a most novel contrivance.

The Steam Bakery is close at hand: the flour put in at the top of the mill comes out finished biscuit at the bottom, and Jack, who is not supposed to be over-fastidious, has long been the only person in her Majesty's dominions who has tasted this article of food made by the aid of machinery alone. He is now, we hear, to have bread whilst ashore. Better late than never. If the reader has ever eaten a captain's biscuit against time for a

wager, he will be able to appreciate the boon this will be to poor Jack.

But we fear we are drawing out this article to an inexcusable length, and yet we have not said our say about the fortifications that girdle round this naval treasure. These, like everything else at Portsmouth, are rendered useless by the long ranges of our modern artillery. Of old the only means by which our arsenal could be reached was by way of the deep channel inside the spit and close alongshore. This passage was sufficiently guarded by the outer forts; but now that a hostile fleet can anchor three miles off and plump down shell out of their reach, the whole existing line of fortifications is rendered useless. Hence an outer range of forts is rising out to seaward: we see the piles driven for ocean forts in the various spits of sand, and along the crest of Portsdown Hill the deep chalk cuttings show the progress made in covering the dockyard in the rear. The question may naturally be asked, why go to such an expense to defend stores that could much more securely be moved to an arsenal in the interior? But this, we know, is dangerous ground to tread upon, and we have no wish to risk a collision with our reader, or with "the powers that are."

*

AIR TRACTION.

How many of the toys of our childhood contain the scientific principles with which, in advanced manhood, we push on the civilization of the world! Boys, for instance, have gone on pea-shooting for generations, and nothing has come of it; but in our day a clever engineer has asked himself, If a pea can travel by the mere pressure of the breath along its peashooter, why should we not turn atmospheric pressure seeking to fill a vacuum to some account in the affairs of men, and shoot, not peas, but letters, parcels, and other light articles, through Brobdignagian peashooters from point to point under our streets? Mr. Rammell has asked this question, and finding men of substance to believe in the feasibility of his plan, has set to work, and is now shooting heavy mails of letters day by day under the streets between the North-Western Railway Station and the North-West District Post Office. The pedestrian passing along Crawley Street and Eversholt Street in that neighbourhood may hear a loud rumble under ground, but he little dreams that, like swift shuttles, carriages are shooting to and fro all day

long beneath the roadway between the two points we have mentioned; and, as a consequence, that the red mail-carts that of old tore along the highway are now seen no more, being beaten out of the field by the peashooter beneath his feet.

The cradle of this new drudge that man has called into service to do his bidding is a modest brick shed near the bottom of the Euston-square Station, which any one is free to enter, and when he does so he is puzzled mightily to understand the use of the strange engines he sees before him. There is the mouth of the tube, and there are the travelling trucks, ready to be thrust into it; and as we look, a bell rings at some little distance up the rail: this is a signal that a mail-train has arrived at the Camden station, and that it will speedily be at Euston Square. At this signal we hear a shovel of coke thrown into a furnace, a small steam-engine begins to beat swiftly, and a whirring sound is heard within a great iron case which is noticed on one side of the shed. This, we are informed, is the pneumatic wheel—the mouth, in fact, which is to propel or draw the trucks through the tube. This wheel is twenty-one feet in diameter, and is composed of two discs of iron, not placed quite parallel to each other, but tapering off from axis to periphery. These discs are braced together by spoke-like partitions, and these partitions communicate with an opening for the entrance of air about the axis. As this wheel rapidly revolves, the air is sucked in at its centre, and thrown off in a perfect gale at its open rim or edge. This gale is not allowed to

disperse itself, however, but when any work has to be done, is confined within a case, just as a paddle-wheel is confined within a paddle-box, and allowed to pass out at the will of the engineer through a pipe in connection with the great pneumatic despatch-tube. In like manner, the air that is sucked in at the axle is all conducted from the despatch-tube by a similar pipe.

Here, then, we have the means of pulling or pushing the travelling-carriages along their subterranean road, and as we speak we see it in operation; for a mail-guard opens a door, throws in two or three mail-bags just snatched out of the guard's van as it rolls into the station, the iron carriages are shoved into the tube, the air-tight door at its mouth is closed, and the engineer, with a turn of a lever, directs a torrent of air upon them, and we hear them rumbling off on their subterranean journey at a rate, as we are informed, of twenty miles an hour. Ere we have done looking and wondering, we notice that a water-gauge, on which the eye of the engineer has been fixed, becomes depressed at one arm and elevated at another. "It has arrived," he says; and almost ere he has said it, a bell connected with an electric telegraph warns him that the attendant at the other end of the tube is about to thrust the carriage into the tube on its return journey.

It had been pushed along, as we have said, by the pressure of air thrown out by the wheel, but it has to be pulled back by suction; the valve of the suction-pipe, in connection with the centre of the disc, is

accordingly opened, and speedily we hear a hollow rumbling, and out shoots the carriage, ready once more for fresh bags. At present 110 mails pass in this way from the station to the district post-office during the day, and not only letters but trucks of iron of the weight of five tons have passed, and adventurous visitors now and then perform the journey to their great delight.

The principle having been thus practically tested, the Directors are getting ready to lay down a 4ft. 6in. tube between Euston Square terminus and the W.C. District Post Office at the corner of Southampton Street, High Holborn, and thence along Holborn Hill to Smithfield Market, the General Post Office, and the depôts of the great carriers in Gresham Street, Messrs. Pickford and Messrs. Chaplin & Horne, both of which firms have entered into an arrangement with the Pneumatic Despatch Company to carry their parcels to and from the station.

Without doubt, before long, all the main thoroughfares will be traversed by these swift shuttles, passing to and fro by the impulse of the air — performing the part of letter-carriers between distant parts of this great metropolis, and consequently multiplying the deliveries, and shortening the time in which they are transmitted, giving us also an hour or more later for writing our country letters than in the old days of the mail-carts, which may be expected to grow as scarce as mail-coaches.

But the public will scarcely gain less advantage from the action of this invention as a carrier and a

parcel-delivery company. Our streets are at present blockaded at certain times of the day by the three-horse railway waggons passing between the great carriers and the railway termini. This traffic will be greatly lessened, if not totally annihilated, as the Pneumatic Despatch Company ramify their carrying-tubes through the metropolis, and pass underground the goods going from station to station, and again from the stations to our great markets.

The magnitude of this traffic is only known to those who carry it on. Taking Camden Town as one of the stations which supply the London commissariat, we find that a hundred tons of meat and poultry daily pass thence to Smithfield, and ten tons of butter; whilst thirty tons of fish pass daily from Billingsgate to the railway station, and an equal weight of oranges and dried fruit escapes into the country by the same outlet. We scarcely dare say how many tons of vegetables are brought into Covent-garden Market by the spring carriages of the different lines, but we may mention that the South-Eastern Railway one morning delivered in that market no less than 13,000 baskets of fruit; whilst as much as two hundred tons a day of rhubarb and other vegetables are sent northward from the Camden Station. A very large share of this immense daily traffic will doubtless fall into the hands of this company, as they will be able to carry so much cheaper and much quicker than the ordinary vehicles possibly can do, and they will be able to deliver directly into the market, and beside the rail.

But, says the reader, if such heavy traffic as this is

contemplated by the promoters of the new carrying system, why not carry people as well as goods? That is just what Mr. Rammell contemplates doing. The great success of the Metropolitan Railway has proved that the public is not adverse to subterranean transit; and, indeed, the impossibility of providing sufficient space above ground over the more crowded portions of the metropolis has necessitated this method of underground intercommunication. Hence we do not fancy there will be any objection on this score.

But, the reader will remark, the atmospheric method of propulsion has been tried, and proved a failure. But that was a system by which carriages above ground were moved by a small piston working in a pipe underground, and the expense of exhausting the air was too great to compete with locomotive traction. A pressure of 10lb. on the square inch was required to move this piston; a pressure of 5oz. is sufficient to move the carriages that Mr. Rammell proposes to drive inside his tubes; and the reason is evident. Each carriage will present an area of say nine feet square to the atmosphere; in other words, the augmented area makes up for the diminished pressure.

But, says the affrighted reader, this projector does not intend that we are to ride in a dark tube with the pressure of a gale of wind blowing upon us? At first sight the objection does seem a strong one; but we must remember that the carriages would be going with the gale, and therefore it would not be felt. There is something exceedingly novel in the method

by which Mr. Rammell proposes to work the traffic. Groups of carriages would be placed at distances coinciding with the stations, and these carriages would be worked by the elastic rope of air in a continuous circuit, just as we see the buckets in the dredging-machines on the Thames working in an endless chain—one set of carriages going along one side of the double tube, and another returning by the other tube. It would be so arranged, however, that between station and station only one group of carriages could be in the tube at the same time, thus preventing any possibility of accident either by collision or by one carriage overtaking another.

It is needless to say that as the atmosphere in these railway tubes would be circulating every moment, there would be perfect ventilation;—we say tubes, but they may be brick arches, just such as those of the Thames Tunnel, only much smaller,—a headway of nine feet, with a width of eight, being quite sufficient for the passage of very roomy carriages, seated like an omnibus and lighted like an ordinary railway carriage.

The plan seems so utterly strange that the reader may shrug his shoulders and doubt its practicability; but that part of the business has been disposed of at Euston Square, and we are informed that the whole plan of operations will, in all probability, be tested in public ere long.

We are told that traffic can be worked considerably cheaper by this method than can be done by the locomotive, and that the cost of constructing an under-

ground rail on this system would also be one-third less than the cost of the Metropolitan line. These are matters which have to be brought to the actual working test; at the same time, the comparatively diminished area of tunnelling required, and the great gain consequent on the abolition of the heavy locomotive, which is so destructive to the rails, tend to corroborate the correctness of the statement. Gradients which would be impossible to the heavy locomotive are ascended and descended with perfect ease by means of the elastic rope of air. For instance, the ascent and descent of the Fleet Valley at Holborn Hill and Snow Hill will be as easily worked as the level road, and the train can work through sinuous curves which would be fatal to the locomotive.

The strong pressure public opinion is bringing to bear upon the Government in favour of keeping the few open spots we have in the metropolis, will doubtless be fatal to many of the schemes which propose to cut and carve our great city in all directions. It seems, therefore, that a scheme which can be worked underground in a space not larger than that occupied by good-sized culverts, and which would not interfere with the great drains—for in the main thoroughfares, such as Oxford Street, there is ample room between them and the roadway—stands a good chance of obtaining public favour. But whether this prove to be only one of those abortive schemes which Time gathers year by year so plentifully in his wallet, or a great invention, there can be no doubt that the Pneumatic Despatch Company have established their

principle of working, and that this great city will henceforth have its lighter traffic and parcels and letters carried on by a circulation of air ramifying in a network of tubes through soil, as the human body was supposed, before the time of Harvey, to be supplied by a similar circulation.

VILLAGE HOSPITALS.

THERE is one great fault in our medical education: in the great majority of cases, the skill of the young surgeon begins to rust as soon as he settles down into country practice. A young man may leave the College of Surgeons with a very tolerable amount of anatomy at his fingers' ends; he may have made demonstrations on the dead body to the examiners' satisfaction, and he may leave for some country village with his diploma in his pocket; but here, as a general rule, his knowledge of the higher branches of the surgical art begins to fade. And the reason is obvious: the great majority of cases he has to treat among the poor are medical cases. It is a very uncommon thing to find severe accidents happening to the agricultural peasant —or at least it has been so; and where they have occurred, the appliances of their homes are so deficient, that as a rule it is the custom to send such cases to the nearest county or borough hospital.

The tendency of this plan is to encourage the hospital surgeon at the expense of the general practitioner in the country; and we may also say at the expense of the poor patient, who often has to be

removed for many miles in a rough jolting cart whilst suffering great agony. Moreover much valuable time is lost in the transit. In manufacturing districts, where machinery at times causes frightful accidents, the local surgeons are in many cases exceedingly skilful and full of resources, for cases of great urgency are occurring every day which must be treated on the spot; and the fact that agriculture is now assuming the form of a manufacture, in which complicated machinery is employed, has led to the necessity for a decentralization of our present hospital system. Such frightful accidents sometimes take place with our steam thrashing and ploughing machines, that the man dies unles he can be treated upon the spot.



Cranley Village Hospital.

Such being the present state of things, we hear with much pleasure that an experiment, hitherto very successful, is being made in the village of Cranley, near Guildford, in Surrey, to establish a Village Hospital. We do not mean some fine establishment, with a fine

building, and a Staff which eats away all the money, but a simple cottage, with half-a-dozen beds and one good nurse and general servant. This excellent institution was commenced in 1859 by the medical officer, Mr. Napper, working in conjunction with the clergyman of the parish, the Rev. J. H. Sapte, who is the visitor and manager, and has generously provided the cottage.

One very important feature of this hospital is that it is not altogether a charity, the patients paying a weekly sum, the amount of which is dependent on their circumstances; thus the pauperizing influence of a mere charity is avoided, and the strain upon the pockets of almsgivers, already exerted to the uttermost, is not much increased. Of course some supplementary aid is required; but we are glad to find that the expenses of maintaining this institution are so light that a very small subscription among the neighbouring gentry is sufficient for the purpose.

This Cottage Hospital, which ought to be imitated elsewhere, is fitted up with six beds, and during the year ending October, 1861, twenty-three cases were received and treated, many of them entailing amputations and other operations of a severe character, the majority of which did well. Those who are acquainted with the workings of our hospitals in large towns are aware that one of the great drawbacks to them is the impurity of the atmosphere. Persons coming from the pure air of the country are always liable to suffer ill-health from the foulness of the air in great cities; but patients taken from the breezy country

downs find themselves in the very foci of disease in large hospitals.

Hospital gangrene and pyæmia are the demons of destruction which ever haunt these temples dedicated to Hygieia, and we appeal to any medical reader for a verification of our testimony when we say that in all great operations the mortality is not less than fifty per cent., the greater part of which is owing to the pestiferous atmosphere which we manufacture by crowding together so many diseased creatures under one roof. The badly wounded agricultural peasant is by the present system transported to a distant city to almost certain death. The superior abilities of the operator avail him nothing, for Nature refuses to work with the surgeon's knife. We have no hesitation in saying that the statistics of a hundred patients in village hospitals would, notwithstanding the comparative inferiority of the operators to the picked men in great metropolitan institutions, show a very much higher percentage of cures than in London, despite the magnificent scale on which hospitals in the latter are conducted. The modest plan on which this little hospital is worked may be gathered from the balance-sheet, made up to October, 1861, by which it appears that the whole expenses for the year were only £140. 9*s.* 7*d.*, whilst the receipts were £177. 7*s.* 11*d.*, a state of things which many of our larger hospitals might envy.

We hear that the success of the Cranley Village Hospital has caused similar institutions to be established in other quarters, and this is a matter in which

selfish considerations as well as philanthropic ones should weigh with gentlemen living in the country. If the village doctors, by means of the training and experience these village hospitals afford, were all clever operators, very many valuable lives would be saved that otherwise perish. The fee of a London surgeon, if summoned any distance, is so large that none but the wealthy can afford to meet it. Persons of limited means must go to the nearest town, at a vast inconvenience, for the very same skill they might get by this decentralizing arrangement at their own doors. In the interest of the poor and the middle classes dwelling in the country, therefore, we beg to call the attention of our philanthropic readers to this admirable institution, in the hope that its example may be followed.

ILLUMINATIONS.

If we are to judge by the standard of the celebration of the Prince of Wales's marriage, the English certainly do not yet understand the art of illuminating. It is true we have not had much practice, as it is but once in the last twenty years that our streets were ablaze with a public rejoicing; but in twenty years the world has been transformed, and we did expect now a little more artistic skill than we witnessed on the marriage of the Queen. But we fear the public at large have no instinct for the beautiful, and do not take kindly to the decorative arts. What acres of bunting and what miles of gas-piping alight we witnessed during that week, and what distinct impression have they left upon the mind? An Englishwoman will hang her shawl upon her back in such a manner that it shall look like a boy's kite; the Frenchwoman will drape herself with it that it shall set off the figure to the best advantage.

This instance is very typical of our general unhandiness in such matters. How a Frenchman must have raved at the way in which London, for a week, displayed its flags across every street! Inspired by the

genius of the washerwoman, enormous pieces of coloured bunting have been hanging from ropes, like so many coloured table-cloths from a clothes-line. To the middle-class Englishman a flag is a flag, and the manner in which it is arranged has very little to do with it. Such a thing as grouping never occurs to him, and probably he thinks that to do so would be to hide too much, not knowing that sometimes the half is better than the whole. In some instances, where the clothes-line method of flag-hanging was departed from, even greater absurdities were observable. Thus, at the Ordnance Office, in Pall Mall, the whole façade of the building was festooned with bunting, which hung against the bare brickwork just like the chains of sausages draping a Christmas turkey; whilst at the Mansion House the City architect — who should have known better,—apparently ashamed of the handsome Corinthian columns, muffled them up from base to summit in red baize, making them look like so many aldermanic legs in flannel.

The same want of originality was observable in the illuminating. The "tasty" Englishman hung out his star upon the external wall with a total disregard to any general effect, and the first letter of the alphabet was in request to a fearful extent; indeed we strongly suspect that the old "V" for Victoria has simply been inverted for Alexandra. At all events, beyond the "A" and the "E," and the Brunswick Star, the shopkeeping minds of the metropolis never ventured to advance. There were transparencies of the happy pair, the Princess suffering under a fearful

obliquity of vision, and the Prince smiling gravely with a bulged cheek; the motto never venturing beyond the wish "May they be happy," which, to judge from their looks, they certainly were not when they were taken. The fearfully monotonous effect of such devices repeated by hundreds was an undoubted reproach upon the public taste, and strongly pointed to the fact that illuminating to be effective should be the result of combined action rather than of individual effort. What, for instance, could have been more simple and effective than the grand double semicircle of light which met the eye in the Quadrant? If all the gas of stars that paled their ineffectual fires in back streets where they were never seen had been thrown into one common fund, there would have been sufficient to have traced St. Paul's and Westminster Abbey in living fire, and a scene would have been presented to the public mind which never would have been forgotten. We know that the genius of the nation is to do everything for ourselves; but if we allow the parish authorities to light our streets for us on ordinary occasions, surely on extraordinary nights of rejoicing we might do the same thing; and by selecting some striking municipal building, we may concentrate our means upon it, so as to produce a noble effect. Indeed, we have only to look at what was done by the authorities for the public buildings to see that there is plenty of ability at command. The group of buildings by the Exchange, and the Government offices in Whitehall, told admirably by the mere force of the uniformity of the style of

lighting adopted; whilst the National Gallery, with its coloured fires and the fountains in the square scattering their shower of silver under the influence of the electric light, was a real success.

But there was an aërial illumination far more beautiful and poetical than anything that our ugly streets, "cabined and confined" as they are, could show. The spectator, lifted above in a balloon, might, on that night, have witnessed a scene of surpassing beauty. The attempt to light the dome of St. Paul's, partial failure as it was, yet showed that the true light for illuminating purposes will find its birth in the electric battery. Standing upon Blackfriars Bridge, we saw the dazzling sun, planted under the cross of the great cathedral, sending its vast ray now and then out into the dark void, lighting up spire after spire, as though the metropolitan mother-church were counting its distant children, touching with fiery finger the glittering vanes, from far-off Bow in the east to Chelsea in the west,—all the while the great dome itself lay hidden in the darkness of night, its outline only being marked by the circles of lamps which rose tier above tier, reminding one of that strange picture by Martin, "Satan in Council," in which the sky is illumined by the like circles of fire.

On the western verge of the metropolis a sight was witnessed, for only a few minutes, which was scarcely less beautiful—the illumination of the summit of the Clock Tower at Westminster. As a distant spectator watched, he saw what looked like a fairy palace in the air, the lovely pavilion-like tracery showing all

its gilded outlines like some vision in the "Arabian Nights." In other directions the distant observer might have seen great statues standing out against the darkness, lit with all the vividness of day: the Duke of York, on his tall column; Nelson, with his sad brow; the Iron Duke, with truncheon pointing towards his place of sepulture. Meantime, citywards the flames of fire shone on the summit of the Monument, and beside the opposite shore a phœnix, traced in fire, gleamed from the lofty tower of the glass-works. In the dark night there was something inexpressibly fine in the appearance of these strange apparitions, seemingly suspended in the air, and nearly all illumined by the unearthly electric light. In any future illuminations we hope to see more made of these points, so eminently calculated as they are to produce an abiding impression.

But we must not forget London Bridge, the dim outlines of which vanished and reappeared with the flickering of the fires in the tripods ranged along its parapet. The statues of the Danish kings, holding aloft their banners, every now and then came into light as the flames blazed up aloft. There was something strangely magnificent in the whole effect, and we congratulate the City architect upon his success in producing a scenic effect which had a touch in it of the grandeur of antique days. Neither must we overlook Temple Bar. Who could recognize the old black and grimy gateway in the festal arch, shining in white and gold, adorned with white statues of Hymen flaming his saffron torch, and blazing genially

with clustered jets of gas? Never before did the old arch look so jubilant, and never before, most certainly, did it look down upon such a surging, shrinking multitude as that which swayed to and fro like a solid wave beneath its arch. Of all the fearful sights of this night, when the streets were filled with such a multitude as the world has never seen but in the hosts of a Xerxes or a Napoleon, the most fearful was witnessed at this point and in the middle of Ludgate Hill, where four poor women were crushed to death in the frantic crowd. This occurrence was all the more sad, inasmuch as the lighting of the dome of St. Paul's was far more effectively seen from any of the bridges than from the narrow gully in which the crowd was wedged. We cannot help remarking here, that we trust on any future occasion carriages will not be allowed to traverse the streets. Half the mischief occurred on this occasion in consequence of the roadway being jammed with vehicles of every description, which could neither get on themselves nor allow pedestrians to proceed. Those who attempted to ride found out what a hopeless method of progression it was; and we hope that in future the police will prevent its being adopted, as it is quite clear that they are utterly powerless to direct its circulation, or to organize its progress in any way.

The use of gas almost entirely displaced the old oil-lamps; but there was one disadvantage in its adoption—its flickering in the wind, which we are glad to find was obviated in many instances by the use of screens of crystal drops. By far the most

perfect illumination in the metropolis was that of Mr. Harry Emmanuel, the Court jeweller. Here evidently a true artist had been employed, and the result was a magnificent piece of illuminated crystal jewellery—we can call it by no other name—in which the pattern was formed by very perfect imitations of precious stones. We have spoken rather harshly, perhaps, of individual efforts at illuminating, but there can be no doubt that this one was absolutely perfect. Poole, the Prince's tailor, also had a magnificent piece of architectural effect in crystal glass, with coloured shields, but although more favoured by the crowd, it was very far from being so artistic as the gem that shone over the establishment of Mr. Emmanuel.

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RAILWAYS, THE GREAT CIVILIZERS.

WHEN we contemplate the changes that have been wrought in British society during the last thirty years, we are lost in astonishment, and our astonishment is all the more increased when we reflect that these changes have been brought about by the application of forces that had been for half a century already well known. Steam and Electricity—the strong brother and the subtle, quick-witted sister—have so transformed this island of ours, that our fathers, if they could come from their graves, would scarcely recognize it as the country of their youth. Since the middle of the last century, the conditions of our locomotive conveniences have been the measure of the civilization of its people. Before the days of Macadam and the accelerated mail system of Palmer, our great towns were almost as much isolated from each other as islands of the Eastern Archipelago. The distances, reckoned by time, were so great, and the cost of travelling so exorbitant, that the wealthy only could afford to travel, and the vast majority of the nation rarely moved further afield than their own immediate neighbourhood. The age

of stage-coaches somewhat ameliorated this condition of things, and distant towns may be said to have become on terms of speaking acquaintanceship. It could not be said, however, that in the days of the road any great mutual relationship existed between provincial towns and the metropolis. They retained their distinctive characters up to the time of the last George, and action or reaction between them, in a social point of view, there was none.

At the entrance of one of the northern railroads there is still preserved the first rude locomotive that ran for passage-traffic on any railroad. This rusty, clumsy-looking machine changed the face of the world. On its battered boiler may be inscribed with truth the words, "Alone I did it." When those wheels first revolved, civilization had entered into a new phase—it began to rush where it had hitherto only crept, and the momentum gained in a few years seems to be accelerating every day.

It has often been remarked that one great invention is the inevitable precursor of others equally great to minister to the necessities it has called forth. The Electric Telegraph was the new-comer. All the conditions of its existence were already at hand when Wheatstone put them together, and henceforth the Railway and Telegraph were wedded, and ran side by side through every civilized land. The first evident fruit of the twin powers was the equalization of prices which it produced throughout the country. The superfluity of one part of the island flowed by a natural law towards the scarcity of another part.

This tendency towards equalization has at length grown even into an extreme, which is well expressed by *Punch* when he asks—"What advantage has Eastbourne over London?—You get the *Times* there by nine o'clock! And what advantage has London over Eastbourne?—You get all the best and freshest fish there!" The railroad, like water, has a tendency to make things find their level. In addition to this great advantage it has resulted in at once rendering available for general use the thousand and one materials that had been formerly precluded from other than local advantage by the charges of conveyance. We may instance the building-stones that are now transported from one side of the island to the other; the small coal that is now made into blocks, and brought from distant pits to London; the fish that is hurried every morning towards London from every sea that washes our shores; and the fruits of the earth that by a natural gravitation find their way towards the metropolitan mouth.

Even the horticultural capabilities of our most remote counties have been called out by the luxurious classes of London. Covent Garden in the early spring is fed by the distant gardens of Cornwall, where the mildness of the climate produces an earlier vegetation than is found in the eastern districts of the island. All our early peas and potatoes, which command such extravagant prices at Covent Garden, are called into existence by the Great Western Railway. In return for these natural advantages, which have kept down the price of living in the metropolis—the metropolis,

the centre of thought, literature, and the arts, spreads her streams of knowledge throughout the island, and vivifies it with her own intelligence. The railroad and the telegraph are fast breaking down the narrow ideas of a limited society, and are replacing them everywhere with larger views drawn from the life of the nation as a whole. Wherever the great trunk-lines radiate from the metropolis there you will find the propaganda of civilization the strongest.

A line of railroad is nothing more than a great nerve and a muscle which communicates to its utmost extremity the brain-power of the capital; it is an acoustic tube, along which vibrate the thoughts and ideas of the rest of the world. There is no such thing now as stale news in our great provincial towns; the daily broadsheet has been called into life by the electric telegraph, and Edinburgh, Glasgow, Liverpool, Hull, and Bristol now know what is going on to the utmost limits of telegraphic communication as soon almost as in London itself. If this were the only fruit of telegraph and rail, it would be sufficient to account for the strides civilization has made of late in our island. But the gains are more than we can count.

The Railway system has been made subservient to a grand educational movement. With a few unimportant exceptions, all the bookstalls opened upon the different stations throughout the country have been gradually converted into circulating libraries. Any book a subscriber may desire is ordered by telegraph, and is sent down on one clear day's notice.

Thus the ideas of the capital permeate the whole population along our great lines of rail, and old modes of thought and action are riven, as it were, by these wedges driven throughout the length and breadth of the land. In the slow course of time we shall see provincialism succumb before their pressure, and the very dialects which now make such a curious patchwork of English as one journeys from north to south will be swept away; nay, the written language itself is undergoing certain modifications to suit the exigencies of railway despatch. All the superfluous letters are disappearing from the directions on our parcels, and the cost of transmitting lengthy messages by telegraph has induced a conciseness of expression by which our tongue is likely to gain in compactness what it will lose in picturesque detail. The railway may also be considered a propaganda of architecture; there cannot be the least doubt that the station, with its airy and spider-web-like roof, has become the model on which all our great warehouses are being built. Lightness and strength, produced by a combination of iron and glass, are everywhere taking the place of those dark and cumbersome structures which of old seemed to be the national expression of the English solidity of character. Nay, if we mistake not, this English heaviness is itself being modified, like its architecture, by the action of the great civilizing agents. The facility with which young Englishmen move about enlarges their ideas, and makes them a far more conversable race than were their fathers before them, and there is, if we

mistake not, a greater versatility and brightness in their minds.

There can be no doubt that the whole aspect of what is called good society has been changed since the advent of railroads. Thirty years ago the "upper ten thousand" were so exclusive that they never seemed to enlarge their boundaries. A new face among society was immediately noted. Now "nous avons changé tout cela." With the railway, town is every season inundated with the representatives of the great moneyed classes, who have found their way into the best society, and have, without doubt, with their new blood brought new ideas. Of old this class, insignificant as it then was, never thought of its "season in town,"—now it has become a necessity to them; and for its accommodation we see the dear and dirty old hotel expanding into the monster hostelries which are rearing their magnificent façades beside all our great railway termini. When this annual wave of provincialism retreats once more into the country, it carries with it the fashions, refinements, and tastes of the better classes; thus the manners of the whole country are becoming by degrees assimilated to those of the metropolis. And it is not only the moneyed classes who take advantage of the railways to enjoy the season of London, but the very poorest of the poor can now and then, in some cheap trip, come for the day from great distances to see the metropolis.

It would be a curious calculation to compare the percentage of persons that had travelled a hundred miles from their home thirty years ago with those who

now do so. The difference would form a good indication of the expansion of ideas among the population. But if the country is getting into the habit of coming up to town, through the facilities given it by railroads, the town is reciprocating the compliment by retreating into the country.

"Brighton and Back every Sunday for Two Shillings and Sixpence:" here is an astounding fact for the cockney. The railways give him eight hours by the seaside for the sum that it would have cost him, in the days when George was King, to get to Richmond and back. What to him, however, is a luxury, has become to the merchant and professional man a necessity; the five o'clock express to Brighton dots London Bridge with a struggling stream of human life, all pressing to their homes across the Sussex Downs. The same may be said of all our great lines of railways; the stations within an hour's ride of town are becoming the centres of towns of villas, and the price of the annual railway-ticket is calculated as a small addition to house-rent. The city of London, through the instrumentality of railways, is emptied every night, and filled again in the morning. The hard faces that are blanched in the office or counting-house during the day, in the summer evenings recover the florid hue of health in the bright air of sunny retreats, where roses and children bloom. The same process of interchanging city for country life is going on in all our large towns supplied with railways. Can the importance of this influence of the rail upon health be over-estimated?

There can be little doubt, we think, that the Rail has been mainly instrumental in shortening the hours of labour and of business. Thirty years ago there was no incentive for the City population to close early. The country was so far away that they could not take advantage of spare hours after work was done to get a mouthful of fresh air in the fields; the Saturday half-holiday would only have been a movement in favour of the publicans. Now, when half an hour takes the pent-up cit to Hampton Court, or in half a dozen directions, for revival from London smoke, the habit is growing upon us to fly out into the country as often as possible. As far as the health of the population is concerned, however, we think the railroad has not yet been sufficiently utilized in the direction of the working man. The extraordinary increase of value of all building-ground in the metropolis is beginning to tell most seriously on the working classes; in order to economize room, houses are built back to back, without the slightest attempt at ventilation, and in these dens the ingenious workmen of London are forced to house themselves. The smallest room cannot be obtained near the heart of the City under five shillings a week, and for this rent it has been proved over and over again that a cottage, together with a pass by railway, may be obtained in good air seven or eight miles from town. Surely, as Mr. Pearson has pointed out, if railroads can carry coals at the low rate they do, they could afford to carry workmen at an equally low rate.

We are given to understand that at least one of

the railway companies has seen the force of this argument, and is prepared to enter into a contract with an association engaged in building a workman's village, to bring the men up by an early train in the morning, and carry them home again, for an annual ticket, which, added to the rent, would still bring it under that charged for the dog-holes which they at present inhabit. Convinced as we are that the very foundation of the elevation of the masses lies in the housing question, we look upon the agency of the railway in this direction as one of the most important social schemes of the day, and we feel that it is destined to work a revolution in the condition of the bone and sinew of the population of all great towns. Whilst the action of the Rail upon great cities is undoubtedly centripetal, as we see in the mighty mansions of London and Paris, since their introduction, it is at the same time centrifugal,—wherein lies the secret of its mighty civilizing power. For whilst large aggregations of people are necessary to raise the intellect to its highest pitch of refinement and power, large and constant dispersions of them are imperatively called for to produce that high physical condition on which all sound civilization must rest. We might, then, safely assert that the Rail and the Telegraph have accelerated the onward march of the human race in a greater degree than any other human invention since that of Printing and the discovery of the Compass.

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BOAT-BUILDING BY MACHINERY.

MR. THOMPSON'S system of Boat-building by Machinery, which has just been introduced to the British public, is one of the most ingenious applications of labour-saving machines we have yet seen. We have been so accustomed to see Brother Jonathan supersede skilled labour by clever mechanical appliances, that we cease to wonder at any new contrivance, and are quite prepared to find human fingers improved by him off the face of the earth. The sewing-machine laughs to scorn the fingers of the sempstress; the labour-saving machinery of Springfield enables us to manufacture every portion of the Enfield rifle without the intervention of the human hand; we reap and mow by the tireless muscles of iron, instead of those of flesh and blood; and our own Babbage shows us how to calculate by machinery; yet we question if any great branch of human industry seemed less likely to be invaded by iron limbs than the handicraft of the boat-builder. When we are told that a cutter, 30 feet in length and of 25 tons burthen, can be turned out by machinery in five and a half hours, we have a right to feel

incredulous. Why, a toy boat would take longer. Moreover, the application of rigid machinery to such a matter seems incomprehensible. In the lines of a boat not two curves are alike, and at every step the intelligence of the workman would seem called upon to meet the varying conditions of the task before him; yet this is just the handicraft the ingenious New York mechanic has undertaken to whip out of the field, and we must say he has succeeded in proving that he can do so.

The factory in which we saw this process at work was situated in the wilds of Bow; and there was only one man to attend to the different machines. Consequently, it gave no adequate idea of the speed with which the different portions of the boat can be manufactured when the system is in full work, and the principle of minute division of labour is carried out by each mechanic working at his limited task. But the visitors saw quickly enough that the different cutters driven by steam beat the efforts of skilled labour; and, what is of some importance in these days of trades-unions combinations, that the work can be produced under the superintendence of persons of very average ability. There are, we believe, in the Naval Service twenty-four different patterns of boats, and in the Mercantile Marine fifteen. The machinery is calculated to produce any of these patterns, the appliances being adjustable to any size up to that of a yacht of a hundred tons. Every portion of the boat is thus made, and hand labour is only employed in putting together the different portions, which fit

quite accurately. Another advantage of Mr. Thompson's method is, that as the different parts are made in exact duplicate, they are at any time interchangeable; and, in case of damage to any portion of a boat, a new piece can be put in without the necessity of the ship-carpenter's labour. Immense fleets of boats may be packed up and transported from place to place like so many bedsteads, and then put together again by unskilled persons.

It is no easy matter to give the general reader an idea of the working of complex machines,—indeed it is an almost impossible task. We must content ourselves, therefore, with noticing the more prominent appliances by which the fifty and upwards distinct operations are carried on. At the very outset our ideas of a boat-builder's shop are completely violated by the absence of the ordinary tools. Where are the adzes, hammers, saws, and planes we usually meet with in such places? Instead of them, a few tables are dotted about here and there, made of maple or other dark woods, looking more like pieces of furniture than benches. On these work circular saws or odd-looking cutters, projecting at an angle from the centre. Powerful nondescript machines loom in the background. Segments of huge barrels, with moveable hoops—for such they appear to be—puzzle the uninitiated. The circular saw and the simple cutter seem the only instruments employed to perform so many diverse operations. The first machine we saw put in action cut the plank to the exact size and bevil it was required to take when fixed upon the

ribs. Another machine took it within its teeth, and hollowed out one side, whilst it gave the other its convex form. Another machine rebated and bearded the keel in a manner which the highest skilled labour would have failed to have performed. The "Drunken Saw" will excite the admiration of the visitors: by simply fixing a circular saw out of its true plane, it cuts with astounding rapidity grooves of any width. This simple application of a well-known tool is used in making the trellis-work or grating, which is placed fore and aft in man-of-war boats. In the course of five minutes a yard of this trellis-work was made and put together by one man. The bending of the ribs was the next operation proceeded with. They are steamed in the ordinary way, and then they are placed on the solid blocks before likened to segments of barrels, or rather of cones, for these shapes so vary that a number of different degrees of curvature can be got off each block. To the circumference of this block the rib is bent, and retained there by a band of iron. It is then placed in the drying-room, and in an hour it will be fixed in the curve it is desired to take.

There is a machine to plane the ribs on three sides at once, and when all the different parts are completed, an assembling form, for holding them together while they are fastened in the usual way by bolts and screws: this last operation of fastening is the only one done by manual labour.

Mr. Thompson tells us that he can erect sufficient machinery in a space 300 feet long and 150 wide to

produce 6,000 boats a year, or three times the number now manufactured in the three kingdoms by hand labour. With true Yankee sharpness, the inventor hints at the tremendous advantage the possession of the sole patent for these machines would confer on any maritime Power having an aggressive turn. There is, no doubt, something in this; but we cannot help reflecting for a moment on the tremendous aggressive force possessed by any man of ingenuity and perseverance over the old handicrafts of the country; while communities of workmen, whose occupations were heretofore considered safe heirlooms to the end of time, are, one by one, vanishing before the subtle combinations of the scheming machinist. Howe, the American, with his little sewing-machine, has not only commenced the rout of whole classes of skilled tailors, but of shoemakers, sempstresses, and harness-makers. Dr. Dauglish, with his bread-making machine, will sound the first note of the flight of the unwholesome hardworking bakers. The gun-making machines at present employed at Enfield must ultimately destroy the trade of the skilled armourer of Birmingham.

It is sad to think that whole classes of skilled workmen may be thrown out of employ by the invention of some ingenious machine, or some subtle application of chemistry. The silver-platers of Sheffield possibly thought theirs would be a staple for ever, when lo! a little blue spirt of electricity at once takes the bread out of their mouths, and scatters the plating-trade in all directions. This same

blue spirt of electricity has already begun to undermine the very feet of our errand-boys, and where it will end the labour-market little dreams. That society gains by all machinery which helps us to produce cheaply is admitted, but it cannot be denied that individuals suffer just in proportion as the community is enriched. Craftsmen who have spent their lives in acquiring skill in any particular line, cannot turn their hands profitably to any new occupation, and consequently every successful labour-saving machine is a source of great suffering to a few. If our social philosophers could in any way manage to soften the painful transitions which are now perpetually taking place in the labour-market, they would accomplish a great good. We must all admit the truth of Jeremy Bentham's proposition, of "The greatest happiness for the greatest number," but humanity revolts at the idea of purchasing its infinitesimal blessings at the price of the starvation of its units.

These reflections are suggested by Mr. Thompson's idea that his invention will at once sweep away the greater part of the boat-building trade of the country. We know that, happily, new inventions are not adopted in quite such a hurry as inventors could wish, but there is a tendency, we must admit, to more rapid changes in this direction,—there are less prejudices against machinery on the part of masters, and consequently we can foresee increased suffering for the men. Looking at Mr. Thompson's invention in a commercial point of view, there can be little doubt, we think, of its success. If we are not misinformed, our Admiralty

have at once given in, and boat-building by machinery will relieve our national shipyards of one branch of their labour. If this is the case, we may feel pretty sure that the Mercantile Marine will not be far behind, and that the handicraft of the boat-builder is doomed.

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ON TAKING A HOUSE.

In the Vivarium at the Zoological Gardens, Regent's Park, the curious spectator may watch with interest the actions of the Hermit Crab whilst in search of a new house. The corpus of this crab, which appears to be of a remarkably juicy and tender description, unfortunately comes into the world without that crustaceous house with which his commoner brethren are provided; consequently he is obliged to seek some habitation built by other architects, and the domicile he generally prefers is the spiral conch of some defunct whelk. It is the funniest thing to watch him looking out for a new house. With his long claws he turns over the shells that strew the bottom of the vivarium, and when he sees one to his liking he tries it on with the delicacy of a "swell" easing on a coat by Stultz. He gently backs in with a wriggle, backs out, and tries a fresh method of investiture, and if it finally is found to fit walks off with the whelk-shell over stones and rocks in the most dainty manner. He is not satisfied long, however, for as his corpus grows, the fit becomes too tight, and larger premises are required. How

many of us are in a dilemma somewhat similar to the hermit crab! Our premises are getting too small for the increasing family; consequently we have to crawl and poke over empty whelk-shells scattered about the West End to find one fitted to receive our growing and tender nursery. We don't know what the feelings of the hermit crab may be at trying on a new whelk-shell, but this we know,—a change of house is a thing which disturbs us mightily. Even an old pair of slippers are not easily replaced by new ones. How much, then, must a sensitive man dislike to change his house, full of associations; where his children have been born and brought up; behind the doors of which you leave the marks of their growth; perchance in whose chambers yet hover the ghosts of departed dear ones? An old house so grows upon a man that it is some time before he can believe in any other; it has been, as it were, a part of his being, and he can no longer judge fairly of its defects than he could judge rightly of the defects on his own face. What a common thing it is to hear one friend say of another, "I wonder how he can live in such a place." Possibly he may have wondered himself how he could have done so at first, but in this instance familiarity breeds quite the opposite feeling to contempt. This settled feeling, which every man has, that, all things considered, his own house is the best within his reach, considerably prejudices him in looking out for a new one.

When you have really set out in search of a new house, how little the house-agent's catalogue tells

you! What brave representations and what bald results encounter you! As well may you depend upon the auction stock phrase, "all that capital messuage," as upon the descriptions clever agents beguile the public with. When the hunt is not too much prolonged, there is, to some, a singular fascination in looking out for a house. To settle where you shall strike your roots for the next fourteen years is no inconsiderable matter. In a degree it is like moving into a new country. What streets you will have to traverse on your way home, what is the look-out, what are the neighbours like,—all these are questions which are anything but trifles to a man who will be exposed to their influences for years.

But the aspect of the house itself is enough, generally, to determine the choice of a sensitive person. Who, with a fine sense of the fitness of things, would willingly, for instance, take a house approached by a steep flight of steps? When a man comes home tired from his day's work, his door should seem to welcome him, instead of repelling by keeping him off until he has performed a certain amount of treadwheel motion.

In large towns, and especially in the metropolis, no house is allowed to have a character of its own, either good or bad. Our domiciles are like ourselves, too much alike. How could any man, possessing a marked individuality, take a house in Belgravia or Tyburnia, where whole streets of houses seem cast in moulds, like so many bullets? What a weariness of mind takes possession of a man who has to perambulate

such neighbourhoods! The policeman, for instance, whose beat is along Harley Street, or one of those deep trenches—for they can scarcely be called streets—which run north and south, and see the sun but for half an hour in the day,—what vacuity of mind must possess him!

That our new neighbourhoods thus finished all to one pattern by some great builder are productive of a certain amount of mental disease we have no doubt. How infinitely preferable to such thoroughfares are those old [illegible] streets where different men have age after age moulded their houses into a hundred quaint and irregular forms; even if the forms be ugly they are diverse, and therefore a thousand times more interesting to the eye than the dull monotony of pillar and cornice, cornice and pillar, which the architect flatters himself represents the grace and purity of some Grecian order. If a man of intellect takes such a house, he takes it as a dog would seek a kennel—merely as a place to go in and out of; it represents no human thought or mental impression. Fancy the difference of feeling the member of some old family must experience on entering his old house at home and his new house in town. This is an extreme case, but it shows how man can stamp his own mind upon even bricks and mortar.

If a man is on the look-out for a town house, where can he turn in the hope of having his ideas fully satisfied? At South Kensington they are repeating the errors of Belgravia and Tiburnia; he feels as much a want of individuality wherever he goes as

a bee must among his honeycomb cells. Ground landlords measure out one's habitations into limited squares as remorselessly as the instinct of the bee packs together his domiciles into hexagons.

Any man accustomed to the rambling, irregular nature of country houses, open to the wind and weather on all sides, feels an absolute sense of suffocation at being boxed up in a row—crushed in, as it were, by the rank-and-file of houses on either hand, which seem to be continually dressing up to make the sense of suffocation greater. If fashion will crowd together, however, fashionables must expect to be pinched. Yet our great-grandfathers managed to consult fashion and convenience at the same time. There is an old neighbourhood, much beloved of lawyers with large families, which represents the *haut ton* of houses a hundred and fifty years ago; Great Ormond Street and Queen Square, Bloomsbury, belong to the period when fardingales were so big that staircases were spacious enough for the passage of a coach. In Great Ormond Street, especially, there are some noble mansions—a little gloomy, perhaps, but stamped with the heavy dignity of the period they represent. The wainscoting of polished oak or cedar may not be quite so lively as a French paper, but possesses much more character; moreover, the possessor was never annoyed to find that his rooms were lined with exactly the same sprig pattern as a score of new houses to the right and left of him. There is something, too, in the fine brickwork of that period, which takes a critical eye. It was substantial

without any pretence,—unlike our modern mansions, daubed over with a certain odious cement, which gives fashionable London the appearance of having been moulded out of mud; nay, we are assured that the plaster is, in some cases, adulterated with road sweepings,—hence the stains of green vegetation which make them look so hideous. The author of "Vanity Fair," in taste as in story, thus reverts to the time of our great-grandfathers, and his new house in Kensington Palace Gardens may have been one of the old Bloomsbury mansions bodily removed.

As men must be content to live in streets and rows in great towns, there is nothing more to be said about the matter; but there is as much difference, we contend, between street and street as between face and face. A street may be gloomy or bright, damp or dry, hot or cold, according to the manner in which it is built and the direction in which it lies. We have already entered our protest against the Harley-street class of thoroughfare, for the reason that it runs north and south, and rarely lets in the sunlight. But there is another class of street equally objectionable; and as the objection arises out of the cupidity of builders, we fear it will be an increasing one. We allude to the tendency to build tremendously high, regardless of the width of the roadway. Let us take, as an instance, Victoria Street, Westminster. To justify such elevations, the thoroughfare should have been double its present width. As it is, the part that is finished presents such a sullen,

forbidding aspect, that half the finished houses are unlet, and the builders seem in despair at finishing the gaunt carcases which stand so black and sunless on either hand. Then, again, its length is very objectionable. A street of a mile in length, even filled, like Oxford Street, with shops, is fatiguing enough; but imagine, good reader, having to traverse three or four hundred doors with exactly the same knockers and the same amount of social distinction between servants and visitors in the bell department, with the self-same style of windows and window-blinds!

If we seek the suburban districts, we are met, for the most part, with the like sameness of design as we find in town, though of a different kind. The semi-detached villa is the height of gentility, fitted for genteel people with about £300 a year. How these genteel people can find any pleasure in contemplating a strip of fore-court, misnamed a garden on the strength of a stunted cyprus-tree not much bigger than a fox's brush, in a centre bed, and a wretched shrub or two at the sides, is always a mystery to us. Do the genteel people who inhabit them never grow sick of contemplating the rows of foxes' tails, as they pass along in the street? and are they not tired of the monotonous manner in which the laburnum-trees join hands, as it were, over the damp garden-walls? and do they not see the imbecility of having to traverse a meandering narrow slip of gravel path, laid out in an artful, romantic manner, with an eye to direct the attention from the ash-pit

behind the laurestinus-bush? From the thousands of such pretentious mockeries lining our great suburban roads in all directions, we fear these genteel abodes must exactly hit the taste of a very large percentage of the population. Better far a wayside cottage, with an ivy-covered porch, or a clustering jassamine, picturesque in its weather-worn walls, and tiles bright with emerald stonecrop. As a rule, all good suburban houses rather avoid than seek to display their graces to the passer-by. If in your rambles you come upon some old place with its back turned, curmudgeon-like, to the road, be sure the sunlight plays brightly on the other side upon green swards and gay parterres. In house-hunting, make a point of looking behind these forbidding old houses as eagerly as you would get inside an old convent wall. In the neighbourhood of London there used to be scores of these old mansions, dull, demure-looking structures, generally of red brick, time-stained until they harmonized with the verdure around. At the side, perhaps, you would see the black branch of a cedar of Lebanon projecting like a witch's lean and meagre arm. These houses are disappearing fast, to make way for the snug citizen's villa; but a few yet remain, to tell us of the stately tastes of those ancestors we are so apt to despise.

It is among such old places that we generally look for haunted houses. We suppose it is impossible for ghosts to live in well-lit, cheerful domiciles; at all events, they never take up their quarters in new houses, and genteel villas they seem to detest; and

we confess we rather applaud their taste in this particular. Your fine old solemn mansion is, however, sure at some time of its existence to contract a ghost, and if it is gloomy enough, or has a dark yew-tree or two shading its courts, it is pretty sure to keep it. Spiritual personages of all kinds, from the old monks downwards, are certain to be associated with comfortable quarters, and be sure that a haunted house has some very good parts about it; an advertisement for one of these afflicted tenements will often succeed in procuring the very kind of place a person with a little poetry in his composition would like to have. There is another kind of haunted house, however, which always strikes us with dismay — the house haunted by the Court of Chancery. In the country there may be something sentimental in the dreary, hopeless state of a human habitation, as poor Hood has shown; but there is something horribly repulsive in the appearance of a house in town in this deplorable condition. There is a place on Snow Hill which is slowly perishing of law, dirt, and filth, in the midst of the ever-flowing stream of human life; and in Stamford Street, Southwark, again, there are several in a like condition—their windows smashed, their paint decayed, and the ironwork rusting, but still holding [illegible] spectacles of the self-imposed ruin of their owners. Sometimes the bill-stickers will boldly take possession; and we remember a house in Long Acre that was in this way pasted up, hermetically sealed, by huge posters, displaying gigantic trowsers equally tenantless.

What a chapter might be written on the class of Arabs who take care of houses! This subject, however, is a psychological study that cannot be discussed at the end of an article, and we may take another opportunity of considering the subject in the light it deserves.

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THE EFFECTS OF RAILWAY TRAVELLING UPON HEALTH.

THE Editor of the *Lancet* has published a series of "sensation articles" on this interesting subject. We have been so long accustomed to consider the Railway as a means of redressing the evils consequent upon continuous labour in crowded cities, that we are somewhat startled to find it looked upon askant by medical authorities. The means of escaping from the over-fatigues of commercial and professional life are denounced as productive of evils even of a more deadly nature. This is a matter which directly affects the daily habits of thousands of the flower of the metropolitan population. The bankers, the lawyers, the merchants, and even the retail tradesmen have been migrating every afternoon from this brick Babel of ours to the quiet and seclusion of the country. Villages of luxurious villas have sprung up along the lines of our railroads, and Brighton has, in fact, been rendered a mere suburb of the metropolis by the aid of the five o'clock express. The early morning sees these human

swallows return, and the steady sterling Englishman who never strayed of old beyond the sound of Bow Bells, is now become a bird of rapid passage. All he loves lies far beyond his ken, far away over the breezy downs or bright pastures. To fly by night to the sea-coast, he takes the train, as his father would an omnibus journey to Brompton, and the season ticket which enables him to "do" his hundred miles a day is reckoned as a portion of his rent. But is this rapid change of venue a thing of such unmixed good? This question has been gravely asked, and we think answered, in the most unmistakable manner, in the negative. Take a glance at the stream of respectable men, carpet-bag in hand, to be seen hurrying over London Bridge any evening about a quarter to five. You see at a glance that they are well-to-do citizens, who have attained, if not passed, the prime of life. Indeed, it is only Paterfamilias who can afford to indulge in his marine villa. Now, it so happens that this specimen of humanity is the very worst that could be selected for this daily process of being twice bumped or concussed across the South Downs. Dr. Waller Lewis, in his report to the *Lancet*, tells us that it is practically known that only young and selected men can be found to bear the wear and tear of acting as travelling Post-office clerks, sorters, and guards on the great lines of railway, and that only those are allowed to do the duty. Drivers and stokers are selected in the same careful manner by the railway medical officials. Yet your rich stockbroker or merchant, with a well-filled purse, and possibly a

"fatty heart," thinks that he can undertake the same duty, and flatters himself that he catches health as he flies. We believe this to be one of the great delusions of the mercantile world, and that Brighton season tickets have been guilty of more premature deaths to respectable gentlemen than the worst air of the worst part of the metropolis ever has. To begin — the hurry and distress of mind to make his business fit so that he shall not lose his train and his dinner, is in itself a source of daily worry to Paterfamilias which he scarcely realizes himself. Then the hurry to the station, the dodging the crowd on the bridge, and the rush for tickets, is in itself a serious cause of mental perturbation. We put it to any Brighton season-ticket holder whether he is not at times obliged to run to catch his train, and we beg to say that gentlemen who have lost the bend in their backs cannot always run with impunity. A friend tells us that he was greatly surprised some time since to find a gentleman sitting in a chair, with a handkerchief over his face, in the open space where they take tickets at the London Bridge Station: on inquiry of one of the porters, he was told that he had just dropped down dead in the room after running to save the train. It is not often that we see such an awful example of the effects of forced bustle thus dramatically placed before our eyes, but be sure that scores of persons drop down dead in the counting-house, or sleep the last sleep in their beds, from this very cause. True, there are some men who keep stop-watches, and who seem born merely to mark exact time, who are not put out by

this daily struggle to fit their minutes; but these are not made of the finest clay—these are not overburthened with that nervous sensibility which is never absent from high-class organizations, and may bear the fret with impunity; but to the average or better-class man this kind of preparation entirely disturbs his equanimity before he puts his foot into the railway carriage. And here the worry to his nervous system only exchanges its moral for a physical cause. Every man who has travelled by railway must have perceived that, notwithstanding all the appliances to minister to his comfort, he is fatigued in a much shorter time by this method of conveyance than by the rougher journey by common road. He feels quite sore and tired, although he may not have moved—his head aches, and he feels sick; all these are symptoms of concussion of the brain and spinal marrow, and they are, in fact, direct consequences of that cause. When a collision takes place we have concussion in its active form, and mortal injury is done in a moment to passengers exposed to its effects; but in ordinary express travelling, especially on the [illegible] lines, the whole journey is made up of an infinite series of minute shocks. "Man and wife," as George Stephenson called the wheel and rail, do not agree. As the carriage oscillates at high speed, the former is continually jolting against the latter, and at every ten or twelve feet the joints of the rails, which are very imperfectly made, cause a jerking motion. In passing rapidly round curves, the oscillation is sometimes frightful, and it is this action which produces the

sense of fatigue and soreness felt in the back, after taking long journeys by express. The reason is obvious. The great nervous high road traversing the spine has to be protected from shock or motion as carefully as a transit instrument in an observatory; and in order to accomplish this, the long case in which it is enclosed is padded in every direction, and innumerable fine ligaments and muscles are attached to it in order that it may be automatically kept in its normal position. Now, the tumbling and jolting of the carriage are constantly calling forth this automatic action of the muscles: hence the tiredness and soreness we experience after a protracted journey. In the well-padded first-class carriages this motion is not so much felt, but in the second and third it is very obvious. The hard wooden seats and backs convey the motion direct to the body, and especially so when the head is inclined against the back, as in that case the minute concussions are carried directly by the bony case of the skull to the brain, and headache and nausea are the immediate results. Persons should never go to sleep so touching the woodwork, as the result is sure to be injurious. Persons who live, as it were, upon the rail, find it absolutely cheaper, on the score of health, to travel in first-class carriages, in order to avoid the unnecessary evils which penurious Directors inflict upon those in the second. But the nervous system is reached also by the special senses; the perpetual grating and grinding of wheels upon rails keeps the tympanum of the ear in constant agitation, and the

eye is tired by the rapid flight of objects. Thus for two hours daily the Brighton season-ticket holder is subjected to nervous concussions and assaults, conveyed to him by half-a-dozen different avenues. Can it be wondered at that, with the feeble and middle-aged, the process is sure to be detrimental? "It may have been observed," says the *Lancet*, "that the Brighton season-ticket holders rapidly age;" and certainly we could expect no other result from the pounding of the nervous system to which they voluntarily submit themselves, under the mistaken idea that they are in search of health. We feel bound to say, however, that well-selected lives, at an early age, seem to take no injury from daily travelling on railways. Dr. Waller Lewis even says that some of the letter-sorters and clerks in the flying post-office actually improve in health and get fat after a few months journeying in this manner. But they have none of the preliminary worry which ordinary passengers have to go through. It is their business to start every day at a certain time, and they have not to struggle for tickets. Dr. Lewis has much mitigated the evils which arise from concussion, by providing the officials with caoutchouc mats. Why should not Railway Directors follow this excellent lead? or why, again we may ask, do they not supply some proper means of ventilation? As it is, when the carriages are full, we must either close the windows, and suffer all the evils of foul air, or subject ourselves to a hurricane by pulling them open. And why should we not have our carriages warmed? Cold is

one of the great antagonists with which the railway passenger has to contend in winter. A night journey to the North is one of the most depressing things in life, for however we may wrap ourselves up, the dawn of morning always finds us out. We very much question if old stage-coach passengers felt so chilled even in crossing Hounslow Heath in the olden time, as a second-class passenger feels in the railroad carriage in winter after a long ride; and the reason is obvious,—rushing through the air at the rate express trains go necessarily intensifies the cold to an alarming degree, and the wrappers and furs that would be ample for ordinary temperatures are found to be far from sufficient for the cramped passenger in the arctic night of a railway carriage.

As railway travelling is at present conducted, we cannot in the least doubt that the use of daily season tickets for such lengths as between London and Brighton is a gross violation of the laws of health, and that those who use them, in the majority of cases, are riding to their own destruction. We are given to understand that people are finding this out, and that a great decrease in the issue of long-journey season tickets is the result. But we cannot help thinking that as regards short suburban journeys the gain is entirely on the side of the new method of transit. We are now speaking of those who can afford to ride in first-class padded carriages; second-class riders must suffer if they have to perform their journeys in mere wooden boxes, made as uncomfortable as possible, apparently on principle. Since the injurious

nature of these unstuffed carriages has been demonstrated, we think Directors should be forced to fit them up in a better manner. The advantages of transporting our toiling population from crowded cities to the good air of the country are immeasurably greater than the evil done by the half-hour's journey, performed at low velocities, which is sufficient to reach the most secluded and healthy country districts.

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PHOTOGRAPHIC PORTRAITURE.

TEN years ago, when the miniature-room of the Royal Academy used to be mobbed by fair women, bent either upon criticising their friends or furtively admiring their own portraits, who could have foreseen that Sol was about to wrest the pencil from the hand of the cunning limner, and annihilate one of the oldest callings connected with the Fine Arts? The income of a Thorburn or a Ross seemed as assured as that of an archbishop against change or curtailment, and no high-born lady's boudoir was complete without a portrait of herself paid for at a princely price. The introduction of the Daguerreotype process, some five-and-twenty years ago, seemed only to fix more firmly the claims of the brush against the art of the photographer. Tompkins or Hopkins may submit to go down to posterity as livid corpse-like personages; but the Lady Blanche or the fair Geraldine, forbid it, oh Heavens! Presently, however, Fox Talbot appeared upon the scene, and the dull metal, which only enabled you to see your friend glaring at you at an almost impossible angle, gave way to photography, in which the image was fixed upon paper. The

Collodion process followed, and from this moment the occupation of the miniature-painter was gone. A truer draughtsman than either Thorburn, Ross, or Cooper of old had appeared on the scene, and year by year we looked with a diminished interest for [illegible]'s beauties in the miniature-room of the Royal Academy screen.

Our International Exhibitions, in these days of rapid progress, serve the purpose of estimating our advancement since the last decade; and in no department of science or industrial art had such an advance been made, between the years 1851 and 1862, as in that of Photography. In the former year, a few portraits exhibited by Messrs. Henneman of Regent Street, who at that time held the exclusive patent to produce [illegible] by Mr. Fox Talbot's process, represented the art as it then existed. In 1862, the splendid collection of sun-pictures in the glass-room of the International excited the admiration of visitors to such a degree, that exclamations were heard on all hands against the Council for placing them in such an out-of-the-way place in the building.

Photography has now become an institution; its professors are counted by the thousand in the metropolis alone, and portraits, once obtainable only by the rich, now hang on the walls of the meanest cottage. Take a walk down the New Cut, Seven Dials, or any other unsavoury locality, and there you will see how Sally the cook and Billy the potman, or the wooden visage of Policeman X, are exhibited to an admiring New Cut circle; and who shall say that, if not quite

so fine, yet that they do not look far more natural than "portraits in this style, 10*s.* 6*d.*," of a dozen years ago?

But every art that ministers to the vanities of the public is liable every now and then to run riot in matters of taste; and so it is with photographic portraiture. Let us take the *carte-de-visite* mania for example, and turn over the album at home, which by mutual exchanges contains all our friends. There is Mrs. Jones, for instance, who does the honours of her little semi-detached villa so well: how does she come to stand in that park-like pleasure-ground, when we know that her belongings and surroundings don't warrant more than a little back-garden big enough to grow a few crocuses? Or Miss Brown, again, why should she shiver in a ball-dress on a verandah, and why should we be called upon—instead of looking at her good honest face—to admire the far stretching lake-like prospect at her back? Then there's Mr. Robinson, standing in a library with a heap of books put within reach of his hand. Now, all Mr. Robinson's little world know that he never looked into any book but a ledger in his life. It will be observed that it is the photographic artists who court the lower stratum of the middle class, who most delight in these scenic arrangements; and no doubt they know what they are about. But sometimes it happens that people who ought to know better permit themselves to be made the lay-figures of the photographer's ideal landscapes. We suppose that besetting evil of society, the love of appearing what

we are not, is at the bottom of this small but very prevalent sin.

If the class of individuals who love to be surrounded with these fictitious landscapes had the slightest knowledge of art, they would perceive that, independently of the "humbug," the cutting up of a portrait with balustrades, pillars, and gay parterres is fatal to the effect of the figure, which should be the only object to strike the eye. For instance, we saw the other day a *carte de visite* in which a young lady was represented reading, with her back to an ornamental piece of water, on which two swans were sailing, and appeared to be grubbing with their bills at the sash behind her back. Again, there is a portrait of Her Majesty to be seen in the shop-windows, in which she is so posed that a tuft of verdure in the background appears to form a head-dress such as Red Indians wear—the ludicrous effect of which may be imagined.

It must be confessed that the Royal Family have fallen into very bad hands, for their photographs are, one and all, slanders upon the Royal race. There is one of the Queen and Prince Albert standing up looking at each other like two wooden dolls; and there is another of the Princess Beatrice seated upon a table, with her frock so disposed that it appears to form but one piece with the tablecloth, the effect being that this infant of five seems planted upon the full-blown crinoline of a woman of forty. The Heir-Apparent and his young wife fare no better; indeed, the familiarities taken with the future King and Queen of England are of a far more offensive kind, as they

sin against propriety and good taste rather than against artistic rules. What would have been thought of Sir Thomas Lawrence if he had left us portraits of the Prince of Wales and Caroline of Brunswick indulging in those little familiarities which lookers-on goodnaturedly avoid seeing? But the Photographer Royal of Bruxelles has not hesitated to take advantage of the natural frankness and amiability of their Royal Highnesses, to pose them in a manner which, to say the least of it, jars on the good taste of the fastidious beholder. Princes of the most exalted rank clasp each other's hands, we suppose, like other people, and an arm rests as naturally around a Royal neck as it would round a peasant's; but there is a sense of propriety about these matters, without being prudish, which all understand but this unlucky photographer.

No photographic portrait looks so well as one with a perfectly plain background; and we advise all our readers to avoid those who put us into splendid domains and far-stretching forests, either with or without our will. But there is the question of dressing to sit to the sun just as there would be to a Ross or a Wells — indeed, the sun is more exacting than either of those artists.

If the photograph is to be coloured, it matters little what the tint of the costume may be as far as the fidelity of the portrait is concerned; but it is otherwise with those that are to remain plain. For instance, an English officer taken in his uniform is surprised to find that instead of a shade representing

red it turns out black. The charming mauve of a lady's bonnet is transformed into white in the same manner. On the contrary, a yellow dress is represented in a photograph by pure black. The reason of this is that the blue rays of the spectrum (and all the intermediate shades of mauve, purple, puce, lavender, &c., in a more or less degree) act upon the nitrate of silver of the negative in a most powerful manner, whilst the yellow ray does not affect it at all: this may be seen by a visit to the photographer's room where he prepares his plates, the windows of which are shaded with a yellow blind to prevent the light affecting them. Now, as the positives, or portraits, are printed from the glass negatives by the simple plan of allowing the light to fall through them upon the prepared paper, the lights and shades must be reversed.

The moral to be drawn from this little story is, not to indulge in the colours we have mentioned when we visit the photographer. The good sense and the good taste of most ladies lead them to this conclusion, however, without knowing anything of the chemistry of the matter; and black silk is now almost universally worn for photographic purposes. Mind, good reader, it must be silk, not bombazine, or any of the cotton varieties of black, as the admirable effect of silk depends upon its gloss, which makes the garment full of those subdued and reflected lights which give motion and play to the drapery. A dead-black cotton or woollen material would be represented by a uniform blotch, like a smear of soot; and a white dress, on

the other hand, would appear like a flat film of wax, or a piece of cardboard. A combination of black net over white is, however, very effective; and an admirable softness and depth of colour is given to a photograph by the use of sealskin or velvet. This, though but the millinery of the art, is very necessary to be attended to, as otherwise the efforts of the best photographer will be of no avail.

The commercial value of the human face was never tested to such an extent as it is at the present moment in these handy photographs. No man, or woman either, knows but that some accident may elevate them to the position of the hero of the hour, and send up the value of their countenances to a degree they never dreamed of. For instance, after the great fight with Heenan, Tom Sayers was beset by photographers, anxious for the honour of paying for a sitting; but his reply was, "It's no good, gentlemen, I've been and sold my mug to Mr. Newbold," that sporting publisher having seen betimes the advantage of securing the copyright of his phiz. Thus a new source of income has been opened to first-rate photographers, besides the profit arising from taking portraits. A wholesale trade has sprung up with amazing rapidity, and to obtain a good sitter, and his permission to sell his *carte de visite*, is in itself an annuity to a man. For instance, all our public men are what is termed in the trade "sure cards;" there is a constant demand for them—a much greater one, indeed, than can be supplied. It must be remembered that every picture has to be printed from the original

negative, and the success of the printing process depends upon the weather; in foggy, dark days no impressions can be taken from the negative. It is true that negatives can be taken from positives, or from *cartes de visite* already in existence; but the result is a deterioration of the portrait, a plan never resorted to by first-class photographers such as Lock and Whitfield, or Silvy, although dishonest persons are to be found who will commit piracy in this manner for money.

The public are little aware of the enormous sale of the *cartes de visite* of celebrated persons. An order will be given by a wholesale house for 10,000 of one individual—thus £400 will be put into the lucky photographer's pocket who happens to possess the negative. As might have been expected, the chief demand is for the members of the Royal Family. Her Majesty's portraits, which Mr. Mayall alone has taken, sell by the 100,000. No greater tribute to the memory of his late Royal Highness the Prince Consort could have been paid than the fact that within one week from his decease no less than 70,000 of his *cartes de visite* were ordered from the house of Marion & Co., of Regent Street. This house is by far the largest dealer in *cartes de visite* in the country; indeed, they do as much as all the other houses put together. The wholesale department of this establishment, devoted to these portraits, is in itself a sight. To this centre flow all the photographs in the country that "will run." Packed in the drawers and on the shelves are the representatives of thousands of

Englishwomen and Englishmen awaiting to be shuffled out to all the leading shops in the country.

What a collection of British faces! If a box or two of them were to be sealed up and buried deep in the ground, to be dug up two or three centuries hence, what a prize they would be to the fortunate finder! Hitherto we have only known our ancestors through the pencils of certain great artists, and the sitters themselves have all belonged to the highest class. Hence we are apt to attribute certain leading expressions of countenance to our progenitors which are rather owing to the mannerism of the painters than to the sitters. Thus all Reynolds's beauties possess a certain look in common; if we believed his brush without any reserve, we should fancy that the English race of the latter part of the last century were the noblest-looking beings that ever trod the earth. No portrait of man or woman ever came from his easel with a mean look. The same may be said of those of Gainsborough and Hoppner, and the result is that all our knowledge of the faces of the last century is purely conventional. But it is far different with the *carte de visite*. Here we have the very lines that Nature has engraven on our faces, and it can be said of them that no two are alike. The price, again, enables all the better middle class to have their portraits; and by the system of exchange, forty of their friends (happy delusion) for two guineas!

Let us imagine, then, a box of such pictures discovered of the time of the Commonwealth, for instance, or a few years later. What would we give to have

such pictures of old Pepys, his wife, and Mistress Nip? Yet treasures such as these we shall be able to hand down to our posterity; for there is little doubt that photographs of the present day will remain perfect, if carefully preserved, for generations. Some of our leading photographers have the negatives of sitters in number equal to the inhabitants of a large country town, and our great thoroughfares are filled with photographers; there are not less than thirty-five in Regent Street alone, and every suburban road swarms with them. Can we doubt, therefore, that photographic portraits have been taken by the million? Out of these the great wholesale houses, such as Marion & Co., have the pick. Every day brings up scores of offers of portraits, which are accepted or not, according to circumstances. In many cases the sale is wholly local, in others nearly wholly metropolitan. Some have a perpetual sale; others, again, run like wildfire for a day, and then fall a dead letter. Some special circumstance or action scatters these portraits wholesale: for instance, the pluck displayed by the Queen of Naples resulted in a sale of 20,000 of her portraits; and Miss Jolly was not long ago the rage in Ireland. The sudden death of a great man, as we have before said, is immediately made known to the wholesale *cārte de visite* houses by an influx of orders by telegraph. When the report was abroad that Lord Palmerston was dead, his *carte de visite* was immediately in enormous request; and Lord Herbert to this day sells as well as any living celebrity.

Literary men have a constant sale: Dickens,

Thackeray, and Trollope are bought for every album. Scientific men, again, sell well; but theatrical or operatic celebrities have a run for a short time, owing to some successful performance, and then are not sought for more. The series of Mademoiselle Patti has, however, already circulated to the extent of 40,000 copies. It is a curious fact that the *cartes de visite* have for the present entirely superseded all other sized photographic portraits. This is rather singular, inasmuch as we did not adopt it until it had been popular in Paris for three years. Possibly, however, the rage has its foundation in two causes. In the first place, a *carte-de-visite* portrait is really a more agreeable-looking likeness than larger ones; it is taken with the middle of the lens, where it is truest; hence it is never out in drawing: and then, again, it rather hides than exaggerates any little roughness of the face, which is so apparent in large-sized portraits. Secondly, when a man can get forty portraits for a couple of guineas, his vanity is flattered by being able to distribute his surplus copies among his friends. It enables every one to possess a picture-gallery of those he cares about, as well as those he does not, for we are convinced some people collect them for the mere vanity of showing, or pretending, they have a large acquaintance. There is still another advantage: *cartes de visite* are taken two at a time, stereoscopically—that is, a little out of the same line; hence solid portraits can be produced by the aid of the stereoscope.

When we remember the old style of portrait we were obliged to be contented with; the horrible

limning a lover got of his mistress for five guineas; the old monthly-nurses they made of our mothers; and the resplendent maiden aunts, with their gold chains, watches, and frightful turbans; and the race of fathers we keep by us in old drawers, gentlemen built up stiffly, and all alike in blue coats and brass buttons, with huge towels round their necks by way of cravats; when we remember the art at the command of the middle classes not forty years since, we are deeply thankful for the kindness of Sol in taking up the pencil and giving us a glimpse of Nature once more. But even the great Apollo himself has his mannerism, and it is easy enough to detect a Lock & Whitfield, a Mayall, a Herbert Watkins, a Maull & Polyblank, or a Claudet *carte de visite* by the manner in which it is posed, or the arrangement of the light upon it. It is a great mistake to suppose that the art of portrait-taking has degenerated into a mere mechanical trade; the difference between a good photographic portrait and a bad one is nearly as great as between a good miniature and a bad one. How difficult it is to pose a sitter well, and how this difficulty is increased where the artist has to work with the sun! Of old, in the course of three or four sittings, the natural attitude and best expression of the sitter was pretty sure to come out; but now the difficulty is greatly increased—when a picture has to be taken, say, in half-a-minute, what natural aptitude the photographic artist ought to possess, to seize the best attitude and position at once. To produce a good photograph it requires a thoroughly artistic

hand, and that hand must work, also, with the best tools; consequently, the lenses now in use for first-rate work are exceedingly valuable, and the stock of cameras required by the producers of our best *cartes de visite* costs a little fortune.

Then there are, in addition, all the accessories to make up backgrounds—properties, in fact (which we have denounced)—the most elaborate carved wood-work, the rarest statuettes, shifted and combined in endless variety, so as to give every portrait some distinctive character of its own. All these things cost money, and the tendency is to throw the best business into the hands of a few skilled capitalists; and in London half-a-dozen men entirely command the patronage of the fashionable part of the community.

The establishment of a first-rate photographer is at the same time a counting-house, a laboratory, and a printing establishment. One room is found to be full of clerks keeping the books, for at the West End credit must be given; in another a score of employés are printing from the negatives. In a third room are all the chemicals for preparing the plates; and again in another we see a heap of crucibles glittering with silver. All the clippings of the photographs are here reduced by fire, and the silver upon them is thus recovered. Large apartments are appropriated to the baths in which the *cartes de visite* are immersed, and a feminine clatter of tongues directs us to the rooms in which the portraits are gummed on cardboard and packed up. Every portrait taken is pasted in a book, and numbered consecutively. This portrait index-book

contains many thousands of *cartes de visite,* and a reference to any one of them gives the clue to the whereabouts of the negative.

In comparing the Parisian and London *cartes de visite,* it is important to observe the wide difference which exists between the class of portraits that sell. In Paris, actors and singers and dancers are in demand, to the exclusion of all other kinds of portraits. A majority of these portraits, indeed, are aimed at sensual appetites. Statesmen, members of the Legislature, and scientific men, do not sell at all. In England, we know how different it is: we want to know our public men, our great lawyers, painters, literary men, travellers, and priests; in France, there seems to be no respect or reverence for such people—at least, people do not care to invest a couple of francs on their *cartes de visite,* and consequently they are not produced.

The universality of the *carte-de-visite* portrait has had the effect of making the public thoroughly acquainted with all its remarkable men. We know their personality long before we see them. Even the *cartes de visite* of comparatively unknown persons so completely picture their appearance, that when we meet the originals we seem to have some acquaintance with them. "I know that face, somehow," is the instinctive cogitation, and then we recall the portrait we have a day or two past seen in the windows. As we all know, the value of the photographic portrait has long been understood by the police, and known thieves have the honour of a picture-gallery of their

own in Scotland Yard, to which we shall refer in some future paper; but the photograph is also useful for rogues as yet uncaptured and uncondemned. Thus, when Redpath absconded, it was immediately suspected that a negative of him must be lodged at some of our photographers. The inquiry was made, and one of them was found in Mr. Mayall's possession. An order was given for a supply to the detective force, and through its instrumentality the delinquent, though much disguised, was arrested on board a steamer sailing from some port in the North of Europe.

As regards the merits of Photography itself *versus* the Pencil, it cannot be gainsaid that, although the sun is a better draughtsman than any human hand, yet there are certain drawbacks connected with it which are of moment. And, first of all, it rarely reproduces the best expression of the highest kind of beauty: in this respect it is certainly inferior to the old miniature. The reason is this. The highest kind of beauty consists in expression—it is the play of features which charms, not the mere beauty of the human mask, unimpassioned by the soul beneath. And this expression is just the thing that photography misses. When a man or woman, and especially when a woman sits to the sun for her portrait, the first thing she does is to make up a face—she can't help it, my good reader: let the muscles of your mouth play naturally, whilst your friend is daring you to do so, if *you* can. The consequence is, that the likeness taken of you has either an affected simper, as unlike a natural smile

as German silver is like the real argent, or it is a set and rigid effigy cast in iron.

The old portrait-painter proceeded about his business leisurely—no pistolgrams for him. If the sitter should have happened to have made up a face, it relaxed before the artist's colours were mixed; but the grim camera staring you in the face, and the operator demanding that you "stop as you are," to say nothing of having your head placed in a vice, put to flight the rippling lines about the mouth, and set the eyes in a stony stare. By making a great many photographs of the same person, the unnatural rigidity of the features, it is true, relaxes; but we fear that the plain photograph never will reproduce a charming face, in which the chief beauty lies in expression. When the beauty, however, depends upon form merely, the photograph is perfect; hence classical faces should seek the sun as the most effective artist.

But art is capable of correcting, to a very large degree, the photographic shortcomings we have spoken of. We have seen many coloured photographs which, taken as a whole, neither Thorburn, Ross, nor Wells could have equalled. The mass of coloured photographs we see about are, we confess, beneath contempt; but the manner in which the artists have worked is alone accountable for their failure. The real excellence of a coloured photograph results from the artist following only the outlines which photography has given him on the paper; but the bungling dauber proceeds to destroy this beautiful drawing by painting with *solid* colour, which effectually

hides all the wonderful delicacy of the sun's pencil's touch beneath.

We were charmed with nothing at the International Exhibition more than with the coloured photographs of Messrs. Lock & Whitfield, of Regent Street. The transparency and delicacy of touch left nothing to be desired. It is obvious that the artist has obtained his admirable results by the use of the most transparent water-colours alone; hence all the wonderful drawing remains intact, and gives the perfect likeness, which even the most consummate artist of old was apt to miss. From these portraits it is evident that the most pearly greys and the most transparent shadows can be rendered on photographic drawing with perfect truth; and the beauty, too, is there. Mr. Lock evidently can catch the fleeting expression, and fix it for ever with his brush—at least all the hardness so usual in the plain photograph vanishes under his hand; and if a foreigner would like to see what the better class of young Englishwomen are like, we should recommend him to look at the glorious faces which he may see in the studio of this firm.

But will these coloured photographs last? asks the reader. Time, we reply, is the only test. We have seen photographs ten years old, and these are as good as the first day they were taken. We see no reason that the chemicals should change to a greater degree than the ivory on which miniature-painters were wont to work, and the colours are of course identical in both cases.

A new art has arisen, however, in connection with

photography, which will possibly satisfy those who are doubtful as to the permanency of photographs produced in the ordinary way. Photographs are now taken on porcelain, plain or coloured, with tints prepared with a vitreous medium, and then burnt in, like an ordinary enamel. These are of course indestructible, as far as fading goes, and they look like the rarest works of Boucher; but they are proportionately expensive, and we do not think they are likely to supersede the method now employed.

We must not omit to mention a very charming compromise between the water-colour art and photography which Messrs. Lock & Whitfield have brought into fashion. In order to give the likeness and correct drawing, the face and bust and hands of portraits are taken by the lens, and then enlarged to the size of an ordinary water-colour sketch, which the artist colours and finishes off in the form of a vignette portrait, by a few free washes of the brush. It is almost impossible to tell these exquisite works of art from an ordinary water-colour, but that the drawing of the face and hands is beyond the human draughtsman's power.

The value of the *carte de visite* as an advertising medium is, we perceive, not overlooked, especially by the great sensation preachers. For instance, there is Mr. Bellew, who appears to have exhausted every posture, in order to oblige an approving public. We remember his first likeness, in which he burst upon the town as an ethereal young priest in full canonicals, expressed in the most delicate floating drapery—

evidently a copy from a drawing from some female hand. His later hebdomadal portraits represent the "curled darling" a little more substantially. Apparently tired of giving the public a full view of his sacerdotal legs, a last effort has been concentrated upon his vignetted head. And Mr. Spurgeon—why should we be admitted into the bosom of his family so familiarly? We have no doubt that the tenderest relations exist between him and his spouse, but what necessity is there for exhibiting the pair, in every shop-window, on a rustic seat in the midst of a wood? With respect to his many varied *cartes de visite* whilst in the act of preaching, we may perhaps be permitted to remark that if we saw a little more of "the wood," and a little less of him, it would be a great advantage, as an open rostrum does not set off his person well.

The clergy are a little too fond of seeing themselves in the shop-windows. There is scarcely a pastor in the metropolis whose *carte de visite* is not to be seen in the booksellers' windows. We can understand a flock desiring a remembrance of their pastor, and a private circulation of such portraits may be excusable; but the public can feel no particular interest in preachers the world has never heard of. It may be a convenient fiction to excuse the publication of mediocre charity sermons, on the plea that they were put in circulation "at the request of some friends," but vanity can scarcely be excused so easily. On the other hand, the use of the *carte de visite*, in making us familiar with the features of those who have made themselves famous, is indubitable.

It seems as if we could not realize the nature of a man's sayings or doings unless read by the light of his countenance. When the mind is left to paint its own picture, how we idealize portraits! We cannot help it; we must match the appearance of the individual to the nature of his performances; and how often we find that our ideal and the reality are utterly opposed to each other, and what a confusion the discovery makes in the mind! But in these days the photographer does not leave us time to draw our ideal. If a general wins a battle on the other side of the Atlantic, a fortnight afterwards we find his portrait in our windows almost as soon as the news arrives. If a traveller discovers some unknown river or country, before the details of his journey are forwarded we are taking stock of his face in Regent Street. It may puzzle some people to know how the savages in the desert, which he is still traversing, should know anything of photography; but the difficulty is explained when we remember that there is always some one—"a sister or brother," or one "dearer than all other"—who has cherished a miniature at home. By some unaccountable means the fact is made known to a pushing photographer, and before a week is over, the secret portrait, yet warm from some loving bosom, is scattered by photography broadcast over every European capital.

But who shall estimate the value of the photographic art in a domestic and affectionate point of view? What rude means were only lately at our disposal for estimating the development of our children!

The mark behind the door kept a register of children's altitude, and there our power ended of putting on record all the wonderfully delicate changes our little ones underwent from childhood to manhood. Now the light comes to our aid, and, month by month, if need be, we can permanently put on record every opening charm of youth. What a loveable thing it is to run through the domestic *carte de visite* album, and to note how, year by year, the flaxen-curled darlings have silently grown into the dear, clumsy, Newfoundlandish bobbledehoys, and how, by degrees, they have fined down into the perfect beauty of their *première jeunesse!* Who shall estimate the pleasure that photography has conferred on mankind?

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THE WORKING MEN'S FLOWER-SHOW.

A MOVEMENT is taking place in the parish of Bloomsbury which would have cheered the spirit of Mark Tapley. As far as we can see, there is no possible credit in growing grapes at the rate of a guinea a pound, and in turning out fine plants where untold wealth is at command; but it certainly is a test of care and ability to make flowers grow in the back slums of Bloomsbury. A few individuals a year or two since, at the suggestion of the clergy of St. George's, formed themselves into a society for giving prizes to the working classes for the best flowers grown in pots and windows. To insure their being really tended by the proprietors, and not bought for the occasion, a rule was instituted that the plants should be entered at least six weeks before the adjudication of the prizes, between which times they were visited and watched by the gentlemen interested in the movement. By this means a genuine exhibition was insured, and the show took place in July last, in the garden of Russell Square. The prizes were for different classes of exhibitors—to wit, first for adult persons living in the Little Coram Street district; for persons living in the Mews; for persons

living elsewhere; and for domestic servants. Secondly, for children in National, Infant, and Parochial Schools, and for children in Ragged Schools. The interior of Russell Square certainly never looked so gay as on this occasion, for all the inhabitants of the neighbourhood were present to watch the proceedings. The plants were ranged in a gay tent, and certainly did credit to their growers. Decidedly the best show was made by the persons living in the Little Coram Street district. If the reader happens to know that dingy neighbourhood, he will be able to appreciate the merit of rearing fine geraniums and fuchsias in its dark and noisome courts. The flowers from the Mews were also very good. There is a tendency to grow flowers in Mews—the heart yearns to see some bright green thing in those brick trenches, for they are certainly no better; and it is curious to see what trouble grooms will take to make mimic palings and five-barred gates, brightly painted, to set off their little plantations round their windows. But still more touching was it to see attached to some well-grown plant such a label as this: "Grown in the workhouse by ——." We all know what consolation the little Picciola plant was to the prisoner in the grim Austrian fortress; and doubtless the "balm geraniums," which flourished so kindly in the workhouse, gave new heart to some poor inmate. But we look upon this Flower-Show Exhibition as a sanitary movement of no mean importance. Where a geranium will not live and flourish, we may be sure the far more tender human plant will not exist. We trust the Health Officer of the parish will

take cognizance of these plants, and will consider them as a test of the condition of the atmosphere of the courts under his supervision.

The plants exhibited by the children of the different schools were generally grown from seeds. The stone of a cherry, or the pip of a lemon, or an orange dropped into the flower-pot, has engaged the anxious care of little urchins for months, and the result is a series of little seedling-trees. This may be a small matter horticulturally, but morally it is a large one. With the dropping of this little vegetable-seed in the earth there is also a dropping of good seed into the heart, which one day will bear good fruit. Side by side with the Flower-Show movement for the working classes is another, called "The Clean and Tidy Room Movement," and it will not surprise the reader to hear that many of those who carried off the prize for the best plant also gained the prize for the clean room. A great many prizes were distributed by Lord Shaftesbury, under a wide-spreading tree, in quite a patriarchal fashion, and possibly a ten-shilling prize for a well-grown plant may be the means of weaning many men from the habit of drinking and from the low tastes in which some of them indulge. We hear that similar working men's flower-shows are to be held this year in different parishes in London. We most heartily trust they will succeed. We hail them as a means of bringing together the different classes of society, and also as a means of promoting a taste for pure and simple pleasures suited to the hearths and homes of working men.

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DOCTORS' STUFF.

SCARCELY a more curious chapter in the history of events could be written than one which would trace the beliefs and fashions which have obtained among the community with respect to the use of medicines. Taking up an old book the other day in a medical library, entitled "The Ladies' Dispensatory," we caught a glimpse of the ideas of our ancestors on this subject, which may compare—not much to our own advantage, we fear—with the practice of the big-medicine men of some remote African tribe. If our reader happen to have lived in the good old time—the Arcadian period of "Merrie England," when, according to romantic writers, a few herbs and simples sufficed to medicine the ills which flesh was heir to in those robust days—"a falling sickness," we find, would have been treated with any of the following recipes, or perhaps with a succession of them. "The blood of a weesil, to be drunk; the liver of an asse roasted, eaten fasting; an asse's hoof burned, to be drunk; the brine excrescence growing on the coronet of a horse's hoofe, bruised and drunk in vinegar; stones found in the belly of the swallows' first brood tied in a piece of buckskin and

worn about the neck; cud of a sea-calf, to be drunk; gall of a beare; gall of a tortoise, put in the nose; storks' dung, drunk in water." These are recipes taken exactly as they come from the book of domestic medicine of the days of Cromwell. If we consult the prescriptions of the regular physicians of that day, we find the same spirit running through the loathsome messes they gave to their patients. The dung of all kinds of animals was a favourite *pièce de resistance* with them, and next to that their blood formed the staple of their nostrums.

There was a higher class of prescription, however, then in use, which was evidently aimed at the superstitious feelings of the poor people drugged. The moss from a dead man's skull is recommended for a patient by Sir Kenelm Digby; scrapings from human bones, poundings of a wolf's teeth, and even the hemp of a rope with which a man had hung himself, are to be found among the remedies prescribed less than two hundred years ago by learned Doctors of the College of Physicians. Our surgery was quite as bad. If a wound inflamed, a plaster of "new dung of oxen at grasse" would have been applied, fresh and fresh, from day to day. We find even "verdigrease," a most virulent poison, recommended in a like case. God must have been very merciful to the afflicted in those days, for man, in his crass ignorance, was certainly very cruel. Errors of this kind are traceable in the use of remedies down to the middle of the eighteenth century.

After this time a marked amendment appeared in

the British pharmacopœia. Drugs proper took the place of the disgusting refuse of animals, and the herbs of the garden gave place to medicines of a more potent nature. Prescriptions became less offensive, but we much question if they were quite as harmless as heretofore. The physician, as if to make up for the disuse of articles in his prescriptions calculated to strike terror into his patient's mind, loaded his recipes with every drug that he could well remember. Some of these prescriptions might almost be measured by the foot-rule, and often the ingredients were of so diverse a character that the object of the prescriber appears to have been to have aimed the remedy at his patient's complaint, as a timid householder would a blunderbuss at a robber, in the hope that some of the projectiles at least would hit.

We have got rid of these long prescriptions, it is true; but even at the present day the middle classes are bedrugged in a manner it is fearful to contemplate. The medical service of the country is mainly supplied by what is termed the general practitioner, —a gentleman who possesses the double licence of the College of Surgeons and the Apothecaries' Company. The latter Society is nothing more than a company trading in drugs, and of course it is their interest to increase the consumption of their staples as largely as possible. The general practitioner is entitled by the Apothecaries' Act to make certain charges for drugs sent to his patients, and this practice has now become general throughout the country.

The public are, we fear, wholly to blame for this

very objectionable practice. An attempt has been made by the medical profession to break through it by charging for time instead of physic—a much more sensible method of payment, and one calculated to save the patient from the infliction of unnecessary drugs; but this plan as yet has failed altogether, in the provinces at least. People, as a rule, like to be drugged; they prefer the practitioner who takes active measures; they like something, they say, for their money, and they unfortunately prefer to pay for the coloured bottles of stuff that come into the sick-chamber with such alarming rapidity, to paying the medical man for his time and skill. In the larger towns the patients are more reasonable, and see through the absurdity of putting the medical man under the necessity of supplying drugs that are often hurtful to them.

As a general rule, however, the people like strong medicines, and will have them; hence the doctor, if he will live, must bow to the popular decision. The lower we go in the social scale, the stronger is its tendency to rely upon strong drugs to cure disease. We have only to glance over the pages of newspapers, to see the swarms of patent medicines which address themselves to the eye of the public. Every druggist thinks he is entitled to find out some specific for all the ills that flesh is heir to; and some gigantic professors in this art astound us by the magnitude of their operations. Mr. Holloway, to wit, sends out his pills by the ton weight; and Mr. Morison, with his gamboge boluses, is equal to a persistent diarrhœa

throughout the country. There is a tendency, however, in medicine to rush to extremes, and the abuse of the drugging system has led to the adoption of a doctrine which is tantamount to a practical denial of the value of medicine altogether. It cannot be gainsaid that the upper classes of this country are deeply bitten with the doctrine of Homœopathy. Disappointed with the present routine system of medicine, they fly to one which appeals to their imagination. There is something truly wonderful in the power of remedies which they believe to act in billionth doses, and forthwith they give themselves up to the simple treatment of Nature; for to say that homœopathic doses can have any effect upon the human body is a simple absurdity.

The pleasure of doctoring one's-self—no slight pleasure, as the practice of mankind shows—can be indulged in by its believers to their heart's content. The little cabinets of bottles and the handbooks of symptoms are at hand to minister to the belief that every man can be his own doctor. We have no doubt, that after the use of these pretty little trifles people get well, for it is the tendency of the minor disturbances of health to right themselves. We may concede, perhaps, that the very belief in infinitesimal doses may have some effect towards a cure, for we know how great is the effect of the mind over the body; but this we know also, that where indisposition grows into downright illness of a serious character, either of two things happens. The homœopathist varies his doses to allopathic proportions, or the

patient has recourse to the legitimate practitioner. Nevertheless, we cannot help admitting that the very fact of the existence of homœopathy is a proof that there is something wrong or deficient in our present state of knowledge as to the action of drugs.

Whilst in every other department of medicine our advance has been great, whilst our knowledge of the minute structure of the body has been thoroughly elucidated by the use of the microscope, whilst the science of physiology has taught us the method of action of healthy structure, whilst pathology has gone far to teach us how disease alters these different structures and interferes with their functions, there is one department of medicine the advance of which has been entirely of a negative kind. Therapeutics, or the art which treats of the action of remedies, is very little advanced from what it was in the time of Galen. We cure ague with quinine, and give colour to the cheek by the aid of iron; we subdue delirium tremens with opium, and so forth, but the *modus operandi* of the action of these drugs upon the various organs they effect, we know no more really about than the big-medicine man of the North American Indian.

It may be a melancholy fact to confess, but we know well the best-informed medical men will agree with us that our knowledge of the action of remedies upon the human body is at present entirely empirical. We do not by any means say that an able empiricism in such matters is not a very good thing, and that practically it is of little importance to the patient that

his doctor should know the how, as long as he gets cured; but it must be confessed that it is some reproach to Medicine that there should be such profound darkness as regards the true theory of action of medical remedies, and it is not a little remarkable that it has neither been the fashion of the profession to make deep inquiry into this subject, nor has the bent of any distinguished individual led him into this little-beaten track.

Our experience, day by day, is, however, contracting the number of drugs that we know to be efficacious empirically. Out of the thousands of drugs that load our chemists' shops, and among the numberless preparations authorized to be used by the "Pharmacopœia," we may safely say that we may count on our ten fingers the number of drugs that are really valuable; and whilst the tendency of modern medicine is to simplify the manner of prescribing, the skill of our pharmaceutical chemists is to reduce the bulk of our medicines. Instead of the decoctions, and infusions, and huge boluses with which the sick man was nauseated of old, it is the growing practice to prescribe the active principles alone of medicines, and thus all the woody particles and the thousand and one adulterations occurring in the raw drug, which only passed through the patient to the injury of his stomach, are now being eliminated. Thus far, doctors' stuff is reforming itself in the right direction, and we trust that the thoughtful minds of the profession will turn their attention towards building up what may with truth be called a rational system of therapeutics.

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MESSAGES UNDER THE SEA.

It required many years to bring our system of Land Telegraphs to its present state of perfection. For a long time it was found impossible to send a message a further distance than twenty miles. This feat could be performed only in fine weather; when a storm came on, or a fall of snow covered the poles and wires, it was found impracticable to sustain the insulation of the conducting-wire, and consequently the electricity escaped by way of the suspending poles to the earth. Is it wonderful, then, that our early efforts in Submarine Telegraphy have been marked by so many failures? Instead of passing the wire through the air, which in its dry condition is a good non-conductor, we boldly pass it under the ocean, where it is surrounded by a medium whence its electric spark is eager to escape. We condemn the subtle flame to traverse thousands of miles of wire under the sea, and yet are surprised that in the long journey it finds a minute pinhole by which to escape.

If we could catch a glimpse of the physical formation of the ocean depths, we should, without doubt, find that it possesses precipices as abrupt as

those to be found on dry land, mountains as high, and volcanic formations as rugged as those still pouring forth their lava: yet upon this irregular and unknown surface we cast forth a slender line thousands of miles long, but not more than an inch and five-eighths in diameter (as in the case of the Atlantic cable), allow it to sink for miles through rapid and sometimes diverse currents, and trust that it will remain perfect not only in its conducting-wire but in the delicate gutta-percha sheath which insulates it.

Is it wonderful, we ask, that in too many cases cables thus cast forth to seek an unknown bottom, surrounded on every side by an element working against the efforts of man, are cast forth but to destruction? That this is unfortunately the case is but too evident. Out of, say, 12,500 miles of cable so laid, at the present moment not more than 7,000 miles are working. As might have been suspected, the failure has been almost entirely in the deep-sea cables. We lay our shallow or channel cables with almost as much certainty as we erect land telegraphs; and if the community were to find itself one morning cut off from telegraphic communication with the Continent, it would feel as surprised and indignant as it would at being cut off from its usual supplies of gas or water. With the deep-sea cables, however, it is the exception rather than the rule to lay them successfully. Out of the thousands of miles which are now the exclusive possession of coral insects, zoophytes, and other sea creatures, no less than 6,949

miles belong to four undertakings—viz., the Atlantic, 2,200 miles; the Red Sea and Indian, 3,499 miles; the Sardinia, Malta, and Corfu, 700 miles; and the Singapore and Batavia, 550 miles.

The ordinary obstacles to the laying of a cable in a deep ocean are without doubt very great. In the first place, the "paying-out" process, as at present conducted, is barbarous in the extreme. In but too many cases steam-vessels have to be employed, which are utterly unfitted for stowing away the cable. When great lengths have to be laid, the coils are of such magnitude that they cannot be stowed away in one part of a ship's hold, and consequently in the midst of "paying out," the manipulators have to shift from one part of the ship to another. Then, again, a storm suddenly arises, and the cable hanging over the stern is liable to constant and severe jerks and strains, as the ship pitches in a broken sea. Whilst paying out a cable a vessel must steam right ahead, and has no power to accommodate herself by meeting a sea. Hence she is subjected to greater motion than an ordinary vessel. Again, the difficulty of taking soundings at a depth of two or three miles is so great that it is not to be wondered at that cables are now and then laid on ocean beds which are sure to destroy them almost as soon as deposited.

When to these natural impediments to success we add those created by carelessness, or worse; when we find that, in the language of telegraphy, cables are "starved," or made so slight, in order to save expense, and that they are known to be failures

before they have ever seen salt-water, we cease to wonder that innocent shareholders within these last ten years have cast upwards of two millions of money hopelessly into the sea.

The two great failures which have occurred destroyed for a time public faith in Ocean Telegraphs. Our deep-sea cables were known from the first to have been far too slim and weak to sustain the spark intact during the long journey it had to make. It was jestingly said that putting down an inch and five-eighths cable to cross the Atlantic was like entering a pony for the Derby, and that the Red Sea line (less than an inch in diameter) was as inadequate for its work as a donkey would be to run for the St. Leger.

The history of the Atlantic Cable is "a caution," to use an American phrase, to the speculating public. Considering that it was the longest cable that possibly we shall ever see in one length (2,500 miles), and destined to traverse an ocean whose sounding is measured by miles, the reckless manner in which every step of its progress was conducted is something marvellous. The very seeds of its destruction appeared at its birth. The Company having undertaken that it should be laid in 1857, on pain of losing their concession, and having but little time to carry out their engagement, it was determined that the construction of the cable should be divided between the two great manufacturers—one half being given to Messrs. Glass, Elliot, & Co., and the other to Messrs. Newall. No standard for the conductivity of the copper wire was

laid down, and nearly the whole of the cable was furnished before this very necessary preliminary was settled: the consequence was, that different parts of the cable tested very differently.

A more fundamental error, however, arose in the course of the construction of the portion manufactured by Messrs. Glass & Elliot. It will be remembered that the month of June, 1857, was almost tropical in heat, and unfortunately the cable, when manufactured, was coiled in a tank open to the sun; the consequence was, that the gutta-percha covering, which formed the water-tight envelope to the wire, became so soft that it allowed the conductor to get out of the centre; in some cases it actually sunk through the gutta-percha, and was visible at the under side. Wherever this was the case, the piece was cut out; but it was not contended, even by the manufacturers, that all defects were removed by this botching. The invaluable process of testing the cable under hydraulic pressure, as it was manufactured, was not adopted, and consequently the exact value of its conducting power was not ascertained; indeed, throughout the whole transaction there was an evident disinclination to allow science to prepare the way carefully for a permanent success; and the Directors seemed to have looked upon the undertaking as highly speculative, and to have cared more for the shares showing well for a few days, than for its stability.

The cable, in this lame condition, in one of its halves at least, was completed in July, and in August was shipped in equal moities in the United States' frigate

Niagara, and her Majesty's ship *Agamemnon*. The first attempt to lay it was unsuccessful: a neglect to ease the cable as the stern of the vessel lifted with the rolling sea, broke it at a distance of 335 miles from Valentia. The ships now returned to Plymouth, and the cable was coiled into tanks at Keyham, where it underwent more surgical operations; indeed, if there was any real and lasting vitality in it before, here it was extinguished. If a test was wanted, the first thing done was to cut the cable, and then cobble it up again. Those who had charge of it state that from first to last it was cut into at least a hundred pieces! Of course the result was that it was cut up into a hundred clumsy joints, many of which were made in the course of paying out the cable at sea, and any one of which endangered the life of the wire. The leakage, or the escape of the current through these fractures, was declared to be "very high," even at Keyham; but the poor cable had yet much more to endure ere it found its resting-place at the bottom of the Atlantic.

In the spring of 1858, the cable was again stowed on board the two ships, and after two unsuccessful attempts they proceeded to mid-ocean, and there joining hands, or, in other words, the two ends of the electric cable, they steamed away for either shore. During the paying out, a regular communication was kept up between the two ships; these, however, were so feeble, that some serious damage was made evident. On one occasion the current ceased to flow, and it was anticipated that a fatal fracture had taken place; but

the current, after a short time, came as well as before, and it became evident that the internal copper wire must have snapped from the strain whilst the cable was paying out, the two ends, however, being brought together again when at the bottom of the sea by the elasticity of its sheath.

From the 5th of August to the 1st of September England and America were on speaking terms with each other. Regular messages were not, however, attempted until the 18th of the former month, and at first the utterances of the cable were very feeble. The manipulators principally confined themselves to sending single letters of the alphabet and single words, Newfoundland continually informing Valentia that she could not understand, and urging her to "send slower," and to "send something"—"please send something." Newfoundland appeared to be able to converse much more fluently than her Irish sister. Among the more curious messages sent was one from Valentia. It appears that the keys of a cupboard in which some of the electrical apparatus was stowed were missing, and the question of where they were placed was asked and answered in a few minutes across the breadth of the Atlantic. The only practical use to which the wire was ever put was the transmission of a message from the Horse Guards, countermanding the embarkation of some troops. The conversation went on in a hesitating, half-unintelligible way, until the 13th, when a communication of some length was received, and on the 16th the Queen's memorable message of greeting to the President was

carried across. All New York of course went wild, and a furor was excited throughout the States by the Directors, which England viewed with wonder, but which those in the secret perfectly understood. Then came the President's reply, and the currents were reported to come much stronger. It must be remembered, however, that increased battery power was continually being applied, and there can be little doubt that the forcing of the messages through the disabled wire materially aided in its final destruction.

The conversation was carried on between the two countries, with many interruptions, until the 1st of September, when the following broken message was received at Newfoundland:—"*C. W. Field, New York. Please inform American Government we are now in a position to do best to forward—*" Here, unfortunately, the cable became dumb for ever, and refused to finish the end of the sentence—"*Government messages to England.*"

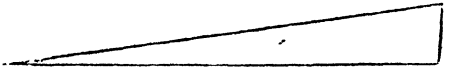
As we have said before, the current appeared to flow much more freely from America to Ireland than *vice versâ;* for, on comparing the number of messages which passed between the two countries, we find that whilst America sent us, in the twenty-three days, two hundred and seventy-one messages, containing 13,968 letters, Ireland could only forward in twenty days one hundred and twenty-nine messages, containing 7,253 words. Thus Newfoundland was nearly twice as voluble as Valentia.

Many attempts have been made to raise and repair the cable; but, owing to its very light construction,

the oxidation of the very fine wire in which it is enveloped, and the great depth from which it has to be lifted, it has invariably broken. Pieces will perhaps be recovered from time to time; but the only use of all that remains from the splendid fortune thus wilfully cast into the sea, in spite of all the warnings of competent electricians, will be to make gutta-percha dolls—the destination of the cores of all worn-out cables.

It is not, however, a matter of entire regret that this cable failed, inasmuch as from its method of construction, so far as the conducting-wire was concerned, it is very doubtful whether it would have been such a success as to have satisfied the shareholders. The Atlantic Telegraph, to pay, must be able to send a certain number of words per minute; otherwise the cost of transmission would be so enormous as to prevent its being generally used. Now, it is very questionable indeed if the old cable (even supposing its insulation to have been perfect) could have worked this paying number. Some of our most eminent electricians said, No. And for this feebleness of conduction there were two causes. In the first place, the wire, or wires, were very fine; and as it is a rule in conducting-bodies that their swiftness of conductibility depends upon their diameters, or bulk, it must be evident that these small wires were a great mistake, inasmuch as they retarded the current. Another advantage of a large conductor is, that it is not much affected by "leakages" that would paralyze a small one. The experience gained in laying cables since the failure of

the Atlantic Cable has been very great. True, we do not find such vast stretches of ocean as the Atlantic to span every day, but cables have been laid in more difficult water and on a less advantageous ocean-bed with success. We have read dreadful descriptions, it is true, of a precipice in the bed of the sea off the west coast of Ireland; but the survey of the ground lately made by Captain Hoskin in Her Majesty's ship *Porcupine* has dispelled this dismal statement. According to his careful soundings, the descent from the Irish bank to the bed of the ocean presents, at its steepest part, a dip of only 19 in 100—an incline which is represented in the following diagram :—



Dip of 19 in 100.

Up such an ascent a locomotive may run with ease. The bottom is composed of a soft ooze, formed by the *débris* of the millions of organic beings which act as scavengers of the ocean, and then, their work being done, descend like fine dust to the bottom, sealing up, beyond power of being disturbed, any cable that may be deposited there.

It must be remembered that the average depth of the water covering the level terrace which runs between Valentia and the coast of Newfoundland is not more than two miles, a depth which is crossed by the cable from Toulon to Algiers, laid by Messrs. Glass & Elliot three years since, and now in perfect

working order. Neither is there wanting experience in cables of great length. Let us instance that between Malta and Alexandria, which was laid by the same firm, and is about 500 miles shorter than the Atlantic Cable, the difficulties of laying which have been so exaggerated. It must be remembered that Submarine Telegraphy has arrived at a perfection which is almost marvellous, considering the little time that has elapsed since the first cable was laid—not more than twelve years since. From that period to the present time fifty-one lines of electric cables have been submerged, forty-four of which are at present in working order, and out of these Messrs. Glass & Elliot have laid no less than thirty. Indeed, so certain seems, to this eminent house, the success of a second attempt at depositing a working cable, that they have agreed to undertake the contract on the conditions of receiving their actual disbursements for labour and material, and a further profit of twenty per cent. on the actual cost of the line in the shares of the Company, whilst they will make a cash subscription of £25,000 to its ordinary capital. This certainly looks like business, and we hope the offer will be accepted. We understand that, towards the new capital of £600,000, upwards of two-thirds has already been subscribed; and, as the faith of the public in the prospects of success in the undertaking is slowly but surely increasing, we may safely anticipate that, ere long, the whole sum will be made up.

It is not our province to enter into details of the monetary part of the scheme, but we cannot help

stating that, if all the promises of returns held out should be fulfilled, there is yet to be reaped a splendid harvest from this field of enterprise. Thus ten words per minute—an estimate below that given by electricians—with the proposed heavy conducting-wire, for sixteen hours a day, at a tariff of 2*s.* 6*d.* per word, would yield a revenue of £1,200 per day, or of £360,000 a year of 300 working days. This sum, together with Government subsidies and other sources of income, will yield, we are told, a gross income of £438,000: a sum which it is estimated will not only pay working expenses and a handsome dividend to both old and new shareholders, but will yield a balance for a reserve fund more than sufficient to lay a second cable in every two-and-a-half years. Be this as it may, the advantages of connecting the New with the Old World by such a line of communication are boundless, to this country especially, whose possessions northward and southward of the United States, so constantly threatened, it would knit together and place within instant call of the mother-country. At a moment when the value of our distant colonies is being questioned by grave professors at our seats of learning, this new instrument of civilization appears upon the scene, destined, in all probability, to solve many of the difficulties in the path of government which of old the sundering ocean placed in our way. It is proposed to employ the *Great Eastern* to lay the new cable, and by this means to get rid of the dangers of laying it incident upon the pitching of a smaller vessel in bad weather. The *Great Eastern*, it is true,

knows how to roll; but this motion is of little consequence compared with the fatal strain put upon a cable by the sudden lifting of the stern whilst great lengths of rope are being payed out in deep water. We see by the last Message of the President that he proposes to lend his countenance to the new scheme: we don't know if this includes the loan of hard dollars or not, but we cannot conceive a scheme which may more legitimately appeal to Government aid in the two countries than the Atlantic Telegraph Cable. Our own Government have already taken under their wing the cable now constructing, to place our Eastern empire in communication with home; but surely the East is not more important than the West, and we should sail along the stream of events like a bird with but one wing, if we neglect to bridge the Atlantic Ocean. It would be a disgrace to us, who were the first to traverse the deep sea with the blue electric spark, big with the fate of nations, if we allowed news from the New World to come to us across the deserts of North America and Siberia and Russia, as it speedily will do, while we are hesitating about a paltry 2,000 miles of ocean, where the cable once laid will never be disturbed. The pathway to the Yankees should not be allowed to pass the Czar's doorway, or possibly he may refuse us a key at a moment when these loving friends may fraternize as they have done before in the hour of England's difficulty.

One would think that 2,500 miles of ocean would prove an obstacle to personal altercations, but this appears not to be the case. Telegraphic clerks, we

are told, are very apt to quarrel with each other if messages are not sent correctly. Mr. Varley, the Electrician of the Telegraph Company, says that telegraph work causes great nervous irritation. "If," says he, "a clerk be thoughtless and do not key very accurately, and so cause one or two words in a message to come indistinctly, the clerk at the distant end, after this has been repeated two or three times, will frequently become so excited as to refuse to work; quarrelling commences, which ends frequently in serious delay to the working of the line." Considering the dilapidated condition of the Atlantic Cable, we may consider it a mercy that a fresh source of quarrel has not been thus mechanically produced between England and the United States. We do not want the relations of the two countries to be further involved by the irritability of telegraphic clerks. Another cause of delay which occurs in telegraphing through such great lengths of water as that which the Atlantic Cable had to traverse, is the retardation which takes place in the current through the charged condition of the wire. To use the words of the report of the Submarine Telegraph Committee, "When a metallic wire is enveloped by a coating of some insulating substance, as gutta-percha or india-rubber, and is then surrounded by water or damp earth, the system becomes exactly analogous to a Leyden jar or coated pane; the insulated covering represents the glass, the copper wire the inner metallic coating, and the water or moist earth the external coating. The electricity with which the wire is

charged, by bringing the pole of an active battery in contact with it, acts by induction on the opposite electricity of the surrounding medium, which in its turn reacts on the electricity of the wire, drawing more from the source, and a considerable accumulation is thereby occasioned, which is greater in proportion to the thinness of the insulating covering." Thus it will be seen that in any case telegraphic communication between us and America must be much slower than it would be by a land line, where the same impediment to the transmission of the current would not exist. When the Atlantic Submarine Cable was defunct, the electricians held an inquest upon its remains, and, according to the conclusions arrived at by the most eminent of the jury, three faults were found in the cable; one at a distance from Valentia varying between 245 and 300 miles, another at 650 miles, and a third near the coast of Newfoundland. A substitute for the Atlantic Submarine Cable is about to be given us in an overland route. Russia will ere very long complete her land line of telegraph to the mouth of the Amoor; when this is completed, a short cable thrown across Behring's Straits will connect this line with the American wire already extending between California and Cape Race on the Atlantic, a distance of 5,000 miles. England will thus be put in communication with America by an eastern instead of a western route—a roundabout way without doubt, and presenting just sufficient difficulties to stimulate the two countries to the completion of the direct ocean path. The Red Sea Cable, intended to put England

in communication with her Indian empire, was laid after the final failure of the Atlantic Cable, and one would have thought its engineers would have profited by the errors of the former undertaking. Every circumstance was in favour of this scheme. The Government gave an unconditional guarantee of 4½ per cent. for fifty years upon the whole capital required for its construction. It was the longest cable yet manufactured, being 3,043 nautical miles in length; but then it had the great advantage of being divided into several sections. The portion between Suez and Aden was laid in three sections. The first, between Suez and Cossire, is 255 nautical miles in length; the second, between Cossire and Suaken, is 474 miles; the third, between Suaken and Aden, is 629 miles in length. The second portion, between Aden and Kurrachee, our most north-western port in India, is also divided into three parts. The whole of this line was finished early in 1860; but unfortunately one section after another failed, and at the present moment the Red Sea Cable is as mute as the Atlantic Cable. Within these last three months a new Company has been formed to restore the communication, and it is intended shortly to complete that portion of the cable which runs between Suez and Kurrachee. The successful laying of the Malta and Alexandria Cable, just announced, will thus bring us within five days of India. The failure of the original cable is, we think, justly ascribed by the Submarine Telegraph Committee to the fact of its having been designed without regard to the conditions of the climate, or the

character of the bottom of the sea over which it had to be laid.

It has been well said that all our experience with regard to Submarine Telegraphy has been gained by a tentative process. No experience of land lines has been of any avail whilst traversing the ocean depths with the electric spark. The submarine cable has to contend with scores of difficulties and obstructions which no previous knowledge could have avoided; and our present experience has been purchased at the cost of upwards of eight thousand miles of cable! It was perhaps an unfortunate thing that the first submarine cable laid between Dover and Calais in 1851 should have been such an entire success, inasmuch as in subsequent cables the method of its manufacture and the proceedings of its engineers were servilely copied, even where nearly every condition was altered. It cannot be doubted that the conditions of each cable should form a separate study,—the form, the weight, and the size being entirely dependent upon a hundred varying circumstances of sea, air, and land.

Thus it was found that the light cables submerged in the shallow sea between this and Holland were continually being dragged and broken by anchors, and a steamer and staff were constantly employed in repairing the breakages thus produced. Since a heavy cable, containing four conducting-wires, has been substituted for the four single cables used of old, ships moor to the cable without injuring it. On the other hand, there is a limit to the laying of very bulky cables, especially in great depths, from the fact that

there is a difficulty in finding shipping to carry them. Thus the Atlantic Cable, though a particularly light one, employed two of the largest vessels that could be found to carry it—the *Niagara*, of 5,000 tons, and the *Agamemnon*, of 3,200 tons. No single vessel but the *Great Eastern* could have accomplished the task single-handed. Had the cable been as thick as it should have been, no steam-vessel, or two vessels at present built, would have been of sufficient tonnage to carry it. Again, a cable once sunk in these depths is irrecoverable; indeed, it is now understood that no submarine telegraph can be fished up at so great a depth as 400 fathoms. The nature of the bottom on which a cable rests has a great deal to do with its preservation or destruction. It has been observed that wherever a cable rests upon ironstone rocks, a galvanic action is set up which speedily oxidizes its iron wires. Sometimes zoophytes attach themselves to the wires, and do serious mischief. When the Hague Cable was lifted it was found that, in one place, it was loaded with "ten miles of rare and fine zoophytes." Where could Mr. Gosse have been on this momentous occasion? These creatures seem to attach themselves to the oxide of the iron wire, which they further corrode by the secretion of an acrid juice from their footstalks. An immense mass of mussels was found attached to the Channel Islands Cable; in some instances such an agglomeration of marine creatures is found sticking to the telegraph lines that they measure a foot in diameter.

A very singular accident happened to the cable laid

in Bass's Straits, Tasmania. This line, which weighed ten tons per mile, was absolutely floated by the immense quantities of kelp or seaweed which became attached to it. Again, it often happens that fatal injury to a cable is produced by seaweed attaching itself to a line situated in a great tideway. The cable is swayed about and speedily becomes abraded, especially if there happens to be a rocky bottom. The Channel Islands Cable once suffered in this way, and gave a singular example of the slight pathway along which the electric current will find its way. The cable had been completely destroyed as regards one side of the hemp, gutta-percha envelope, and wire, and no conducting material remained for three inches but an oxide of copper resting on the other half of the insulating sheath. Nevertheless, along this oxide the current was found to flow. Lightning in one instance struck a cable and ran along under the sea for sixteen miles, when it forced its way out and produced a destructive fault in the insulating envelope.

The ocean bed and its inhabitants, however, are not always the enemies of telegraphy. For instance, it is found that, when the cables have worked themselves into the sand or mud, they are well preserved. The coral insect of warm latitudes appears also to be friendly to telegraphic cables. When the Malta and Cagliari line was taken up, in 1858, after having lain in the water for three years, a most lovely sight presented itself. Mr. Webb, the engineer, who recovered it, says that about Cape Spartivento, "the cable appeared to have been suspended free from the

ground, for the young clean coral completely enveloped it, and appeared to grow out from it equally in every part of the circumference and in a radiating direction. In some places it was so completely covered that not a particle of the cable was visible for forty or fifty fathoms consecutively, and as it came out of the water it had the appearance of a huge but beautiful coral necklace."

The cable had indeed

> Suffered a sea change
> Into something rich and strange,

but it had been perfectly protected from rust.

Besides the causes of destruction which have to be provided against or avoided when the cable is submerged, it has to contend against microscopic mischiefs in the course of manufacture, which speedily enlarge into fatal faults. Thus whilst the copper wire is being insulated with its sheath of gutta-percha, which is laid on in a fluid state, minute air bubbles, scarcely perceptible to the naked eye, create fine punctures in it. When the cable is laid the electric current finds its way out by these channels, and gradually burns the hole until the entire electric fluid is enabled to escape into the surrounding water. It is hoped that the use of india-rubber as an insulator will in future obviate the difficulty.

But there are wilful accidents against which Science is indeed helpless. Thus in laying the Ostend Cable, one of the persons engaged in paying it out, in spite or from some other bad motive, furtively drove a nail through the core, so as to bring into contact the

copper conducting-wire and the outside protecting wire. The consequence was that the current ceased to flow. Had such a piece of spite been perpetrated upon a cable as long as that crossing the Atlantic, a third of a million would have been cast into the sea at once: the "Koh-i-Noor" thrown overboard would not have been so great a loss.

Our belief in the practical application of Submarine Telegraphy to any length, thanks to our advanced knowledge upon the subject, need not be in the least shaken by the mishaps that have already taken place. Our knowledge, gained by a bold tentative process, has solved many difficulties that before seemed insurmountable; and it is also cheering to know that nearly every failure that has taken place is attributable to defined and preventible causes. Numerous advances have been made in the manufacture of the cables themselves. Difficulties of insulation have been entirely overcome, and the application of india-rubber in this service will eliminate in deep-sea cables frequent sources of danger arising from the use of indifferent gutta-percha.

A frequent cause of the retardation and the weakening of electric currents was of old owing to the imperfect plan on which the copper wire was selected. It is now known that the coppers of commerce vary immensely in their power of transmitting the electric fluid. Thus, taking 100 as the mean of the pure metal, it is found that copper from Lake Superior has a conducting power represented by 92·57, whilst Spanish or Rio Tinto copper has only a

conducting power of 14·24, or not greater than that of iron. So essential is the good transmitting power of the metal along which our messages fly considered, that contractors have now to supply it for electric purposes according to its conductivity rather than by weight, a regular standard being always referred to. With regard to the mishaps of paying out deep-sea cables, the Submarine Telegraph Committee of the House of Commons attribute them mainly to the employment of ships not fitted for the duty, and they recommend that special vessels should be constructed with a capacity to admit of cables being coiled easily without injury, and with holds isolated from the engine-rooms. Power and steadiness are other essentials required in vessels employed for laying cables which should not be overlooked. When our great submarine-cable contractors have availed themselves of the suggestions which Science has made, and when shareholders see the necessity of insisting that the cables shall not only be laid but maintained in perfect working order for a certain time, we feel confident that the era of disaster, as regards our means of sending messages under the sea, will have finally passed away.

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SMALLPOX IN LONDON.

An epidemic of smallpox in London in the year 1863 —people packing and running into the country— letters in the *Times* giving "certain" cures for this loathsome disease; other letters detailing the best means of preventing "pitting"—persons blotched with scarcely-dried pustules meeting you in every street! Shade of Jenner, is the merciful shield which thy genius has held over us for more than half a century pierced and broken at last? And are we to mourn the reappearance of a once-conquered plague, and to bewail afresh its ravages upon youthful beauty? There is scarcely warranty for all these fears, but there is quite enough warning given to show us that, although the shield is as impervious as ever, we are neglecting from time to time to use it. The Registrar-General's returns for these last eight or nine months prove that smallpox is gradually gaining upon us, and that for months past the deaths from this disease have averaged something higher than sixty weekly.

The cause of all this is the difficulty of getting the public to take even the smallest trouble for the sake of warding off a merely prospective evil; or perhaps we

may rather ascribe it to that immobility of the human mind which is such a bar to progress of every kind.

Without going into a detailed history of the proceedings of Jenner, we may say that the tardy discovery of vaccination itself affords one of the best examples of the length of time the seed of an idea calculated to save an enormous amount of human suffering to all posterity will sometimes lie in the mind before it bears fruit. Let us take inoculation as an instance.

At a time when smallpox was as destructive as the plague itself, Lady Mary Wortley Montagu, happening to be at Adrianople, was struck with the fact that the Turks were in the habit of making terms with the disease, by receiving it into their system by way of the skin, instead of by the lungs, as in the natural mode of infection. Possibly the lively nature of the lady's letters had more to do with the sensation this new practice created in England than the magnitude of the truth she made known, and to this day we believe that the public have some idea that it was a discovery made by her ladyship, and which she had the boldness to put in practice upon her own son. Yet no fact is more certain than that throughout Asia the practice of inoculation had obtained for ages; and that the Chinese—the inevitable nation to which we have always to go back for the birth of any great discovery—systematically employed inoculation as early as the sixth century. Yet, strange to say, in Asia this precious knowledge came to a dead standstill; and had it not been for the lively English lady, inoculation

might not have been introduced into England for another half-century, and possibly vaccination would even now be in the womb of Time.

That inoculation was a grand step towards the practice of vaccination there can be little doubt, although Science did not at the time appreciate the fact. It taught us that the disease received into the circulation by the skin was infinitely less dangerous than the disease "caught" by inhalation through the lungs, a circumstance which medicine cannot explain to this day. The deaths from smallpox during some of the severe epidemics of the last century were not less than a third of those attacked, but the improved practice of inoculation reduced these deaths to one in two hundred!

This in itself, no doubt, was a grand result, but unfortunately it told only for those who were inoculated; for inasmuch as it was the practice of physicians to send their patients into the open air, and as inoculated smallpox was as contagious as the disease pure and simple, those persons in their turn became centres of contagion. If it had been possible to have insulated every inoculated person until he had passed the stage of infection, it is just possible that vaccination might not yet have been discovered, inasmuch as half-measures often keep off for a long time sweeping reforms; but as this was not possible, inoculation only made matters worse.

This fact was clearly proved by the London Bills of Mortality, which showed that during the first thirty years of the eighteenth century (before inoculation),

out of 1,000 deaths, those from smallpox were seventy-four, whilst during an equal number of years at the end of the century, after inoculation, they amounted to ninety-five—thus proving that the practice had increased the deaths in a proportion of five to four. This result, however, came from putting the practice in force in a crowded city; no doubt the result would have been widely different in country places and among thinly-populated districts, otherwise it would not have been handed down for centuries over vast continents.

But the extreme difficulty with which the idea of vaccination germinated was still more remarkable than the slow progress made by inoculation. It must not be supposed that Jenner was the first to discover that the inoculation of the matter from pustules in the cow's teat afforded a protection to the milkers against smallpox. So far from this being the case, the fact was noticed in a Gottingen paper as early as 1769; and at Keil, in Germany, and also in Holstein, the protective influence of the cowpox eruption was recognized nearly as early. Strange to say, in Asia also, in the province of Lus, the milkers have a disease long known as Photo-Shooter, contracted from milking the camel in the same way as cowpox is contracted from milking the cow, and it is found to be equally protective against the smallpox. It was Jenner's glory that, having become acquainted with the fact from the Gloucestershire dairymaids, by a pure process of induction he proved the value of the protective agent, by first inoculating the boy Phipps

with the cowpox, and, after the lapse of some little time, testing its protective power by inoculating smallpox, the failure of which to produce the dread disease affording the final proof of the value of vaccination. From the lymph taken from this boy's arm, he drew and put in circulation the new life-protecting agent. All the early vaccinations were made from him, and indeed there can be no doubt that a large quantity of the vaccine matter at present in existence took its rise from the ferment promoted in the boy's blood by the original operation performed in 1796. In justice, a bas-relief of this bold youth should have been placed on the basement of the statue to Jenner, as a reward for allowing so doubtful an experiment to have been tried upon his own person for the good of mankind.

Although he suspected the fact, it was not certainly known to Jenner that smallpox and cowpox were the same thing; or rather, that the latter is only a modified form of the former, its venom having been destroyed by passing through the body of the cow.

In the year 1801, Dr. Gassner, of Gunzburg, after many trials, managed to inoculate smallpox into a cow, and from the lymph thereby produced he vaccinated four children successfully; and forty years afterwards Dr. Thiele, of Kasan, not only repeated this experiment, but carried it a step further by placing the vaccinated children in the same bed with smallpox patients, and even had them vaccinated with smallpox matter, with perfect impunity. Since that time, Mr. Badcock, of Brighton, has put this discovery to a highly practical use, inasmuch as by inoculating cows

with smallpox he has from time to time been enabled to put large quantities of vaccine lymph into circulation,—a very important matter, as there can be little doubt that the old stock has become deteriorated, and has ceased to be so protective in its influence as heretofore.

Dr. Jenner, we know, put upon record "his full and perfect confidence that it (the protective influence of vaccine lymph) might be continued in perpetuity by inoculating from one human being to another in the same way as smallpox," and this opinion the Vaccine Board has very lately endorsed. Theoretically this is perhaps true; nevertheless, there is good reason to doubt the fact practically, as operators sometimes take their lymph from imperfectly-formed or over-ripe vesicles, a known cause of enfeeblement of its action. It is well known, at all events, that fresh lymph from the cow "takes better," gives signs of producing more constitutional disturbance, and forms a truer Jennerian vesicle (the great proof of successful vaccination), than is produced by lymph which has passed through a long descent from the cow. As this is a statement which especially refers to the comparatively deficient quality of the general current lymph of the country, it is highly important, and, as Mr. Simon very justly says, it points "to the necessity for a periodical renewal of lymph."

It is pretty generally allowed, however, that even when vaccination is performed on children in the most perfect manner with the purest lymph, there is a necessity for a re-vaccination about the age of puberty;

hence the rush we see for a re-assurance against infection during the existing epidemic.

We have no longer, it is true, the absurd charges against vaccination so strongly urged at the commencement of the present century. Boys are no longer instanced who, in consequence of the influence of the "beastly vaccine matter" introduced into their blood, have been "heard to bellow;" we hear no more of patches of hair resembling cow's hair; horns have ceased to grow from children's foreheads; but the cry is not altogether dead, and we hear from time to time of eruptions over the head and body following the lancet's puncture.

These are mild charges, faults which the great discovery can afford to have placed to its debit, even when untruly made; but in France a far graver offence has been of late imputed to vaccination, and one which has attracted the attention of all the scientific professors of medicine. It was asserted that vaccination was chargeable with inoculating a loathsome disease into the blood. The evidence given was pretty conclusive, and for a time Jenner's discovery seemed to be placed once more upon its trial. The discussion which ensued did not reach the public ear, but it was fierce enough to shake the faith for a moment of good men and true. At last, however, to the intense relief of Medicine, it was ascertained that although the disease had undoubtedly been transmitted *with* the vaccine lymph, yet it had not been transmitted in it,—an unskilful vaccinator having removed some of the blood as well as the lymph of an

infected child, the consequence was that the next child vaccinated received a double infection. This was no charge against vaccination, but only against the manner in which the act had been performed. As there is but one blood disease that can possibly be thus inoculated, and that but under the rarest possible combination of circumstances which may never recur again, all fear under this head may be said to have gone by.

Thus the last chance has passed away of justifying the extraordinary epitaph erected in the church of Rood Lane, City, by the sister of Mr. Birch, one of the surgeons of St. Thomas's Hospital, which commemorates that "the practice of cowpoxing, which first became general in his day, undaunted by the overwhelming influence of power and prejudice, and the voice of nations, he uniformly and until death (1815) perseveringly opposed." Mankind are fond enough of proclaiming themselves true prophets after the event, but perhaps this is the first instance on record in which a man's friends have been so proud of his having been a false prophet as to proclaim the fact in enduring stone.

But, it will be asked, how was it vaccination having been so thoroughly proved an absolute protection against smallpox, that we meet persons in crowded places with the eruption still full upon them, and that more people died in the months of March and April last, from a disease we had fondly imagined banished, than in any two previous years? Nay, so severe has it become, especially among children, that

there has been a regular panic in town respecting it, and there were, at one time, fears among the West-end tradesmen that it would cause the "session" to come to an untimely end.

Let us admit it at once. This result is only one example of the price we pay for our determined opposition to centralization. We put the liberty of the individual above every other consideration, and we see that public danger is the result.

In comparison with most of the great European nations, England, the very source of vaccination, is by far the worst protected against smallpox of them all. Sweden, Denmark, Prussia, and Austria stand particularly high in this respect, for the simple reason that children are vaccinated in those countries with the same certainty that they are registered at birth in this.

Some ten or twelve years ago, chiefly at the instance of the medical profession, a compulsory Act was passed, directing that all children should be vaccinated within four months from birth. The sages, however, who passed this law forgot to enact machinery by which it could be worked. There were penalties, it is true, for non-compliance with the Act, but no reasonable means of putting them in force. When the Act first passed, the public for a time were frightened into a steady compliance with its requirements; but they soon found out that the law if it barked could not bite, and by degrees parents, especially among the poorer classes, began to neglect an act which, for the preservation of their

children's lives, was just as essential as their clothing and food.

Moreover, the duty of vaccination was by some unaccountable blunder placed under the direction of the Poor-law Board, which contracted with medical men for the vaccination of their respective districts. In some cases there is at present such competition for contracts, that there are two vaccinators for one child: consequently poor parents imagine that they are *conferring a favour* upon the vaccinator in allowing the child to be protected against death; and they will attempt to make a bargain with the doctor, saying, "You shall vaccinate baby if you will give so and so a bottle of physic," or if you will "give us a pot of beer." The most rooted antipathy to allow children to be vaccinated—we are again told by the Inspector of Vaccination—is removed by twopence, or the presentation of a toy. Can anything be more absurd than this? If there are faults upon the part of parents, there are also faults in the kind of vaccination which is offered or rather thrust upon them. Upon the efficient manner in which the act of vaccination is performed depends the success of the operation. It is a delicate, if not a difficult, act to perform; but will it be believed that a duty which is necessary to shield the population from a terrible disease is not taught in one of our public hospitals?

The student passes from these great places of study as ignorant of vaccination as the savage in the woods. When he gets into practice he manages to pick up his information as best he can. Consequently, the

method of transferring the vaccine lymph from arm to arm, or from the vaccine point to the arm, differs as widely as the ideas of men can differ who have to act without any previous knowledge on a given subject. Some merely scratch the skin; others make a deep puncture; in some cases only two incisions are made, but the perfect vaccinator will always make three incisions on each arm. In many cases through ignorance the lymph is taken from the arm when it is over-ripe, and the consequence is not only a source of failure in its power of protection, but a fear that it may cause many of those unsightly eruptions which are known to follow the act of vaccination from impure lymph.

We have said enough, and more than enough, to show that in the present state of the law we can never be certain either that the population is well vaccinated, or that the lower stratum of it is vaccinated at all. When an epidemic arises, people rush to the vaccination stations to protect their little ones against the arrows of pestilence which they see flying around them and striking here and there to the death; but the epidemic passes, and their fears with it—a new crop of unvaccinated children springs up, and a new epidemic, to be repeated every four or five years, sweeps off these neglected children, and spreads terror and contagion among adults.

The Government have yet to realize the fact that we must create a standing army of well-trained medical men, well officered, and ready to meet this enemy day by day; and beat him in detail, and not to allow him

to overwhelm us by sudden onslaughts. To give this protective force due efficacy, it should have a medical organization, and not be frittered away among poor-law boards, vaccine boards, or the many conflicting authorities which now create such friction, and make the working of the Vaccination Act a perfect nullity. We have an Officer of Health; why should not the working of the machinery of vaccination be entrusted wholly to him? And if, having given him the proper instruments and subordinates for the due carrying out of Jenner's discovery, he fails (which he would scarcely do), we should dismiss him, and appoint another, as our Yankee friends are now doing with those commanders-in-chief who have failed against the public enemy in the field.

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TOWN TELEGRAPHS.

WHILST this metropolis and all other parts of the civilized world have long been put in speedy connection by means of the Electric Telegraph, the three millions of people living within the Post-Office radius have, until very lately, been denied the use of this necessary of life. This fact is the more strange inasmuch as the dealings of the great public are much more with their immediate neighbours than with those who live at a distance. Yet while any one could be put in instant communication with the mountaineers of Switzerland or the Tyrol, he had not the means of talking across the town with his own wife or servants at Hampstead. Like some pious missionaries, in looking too much abroad we had overlooked the needs of home. However, the pedestrian who makes his way along the streets, on looking up, discovers that the town is being gradually wired in overhead like the cage of the polar bear at the Zoological Gardens, must have discovered that this omission is in rapid progress of being corrected. In fact, telegraphic companies are running a race to take possession of the air over our heads, which almost equals the speed with which

the engineers are burrowing underground with their rails. Look where we will aloft, we cannot avoid seeing either thick cables suspended by gossamer threads, or parallel lines of wire in immense numbers sweeping from post to post, fixed on the house-tops and suspended over long distances. Two companies at present contest the aërial right of way, the District Telegraph Company and the Universal Private Telegraph Company. The wires of the former may be known by their being hung in parallel rows like those we see running beside the railway lines, and the latter by the thick cable slung from the two wires above.

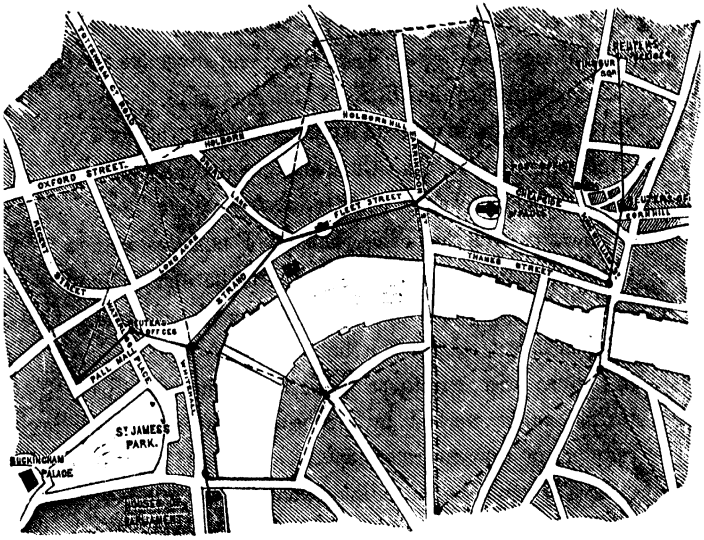
As the public have the more direct dealings with the former company, we may first describe its method of action and organization. Originally the wires of this company, insulated by gutta-percha, ran underground in pipes sunken beneath the pavement, but the difficulty of preventing injury from the damp has induced the engineer to adopt in most recent lines the overhead system; consequently not more than one-third of the wires are now subterranean, whilst two-thirds are hung aloft, and simply galvanized to prevent oxidation. Within a radius of two miles of Charing Cross, the crossing and recrossing of these wires overhead is incessant, and the public are never distant more than five minutes from any office for the reception of messages. As the area becomes more extended these stations are more scattered; but along all the great lines of road telegraphic stations are sure to be found within a mile of each other. At the present moment there are upwards of eighty

stations in the metropolis and its environs belonging to this Company, all of which are in direct communication with the head office in Cannon Street; indeed, all the lines must, by present arrangements, speak through this centre, just as all nervous impressions must be conveyed through the brain. This is by no means a necessity of the system, but only a condition of progressive development, which will be altered as the public call for more accommodation,—and they are doing so every day. Before long, district centres for collecting and re-distributing messages will be adopted, as they have been by the Post-Office authorities. Meanwhile, the delay caused by the circuitous routes taken by the wires is not very great. We wish particularly to call attention to the question of time in the forwarding of messages by this Company, as many persons are under the impression that a *commissionnaire* can do his "spiriting" quicker in consequence of the delays in transmitting a message and its porterage. We may say that in no case, except by culpable neglect, should a telegraphic message take more than half an hour in reaching its ultimate telegraphic destination, a delay sometimes unavoidable, in consequence of the wires being already engaged; but all delays consequent upon the little boy who generally acts as Mercury being out or engaged when the message arrives at the suburban or other stations, are inexcusable, as by a rule of the company the office-keeper, who is generally either a proprietor of a district post-office or a small tradesman, is empowered, after ten minutes' delay, to call in an extra messenger, of which

there are always plenty hanging about. If, then, any person should experience extraordinary delay in receiving a message, he should, as a matter of duty, complain to the Secretary in Cannon Street, for it is only by so doing that the sound working of the system can be insured. We have been very slow in adopting the new system, but the public are beginning rapidly to see the value of the wire in intra-metropolitan communications. For instance, the messages have increased from 73,480 received in 1860, to 251,548 received in 1862; and the trading community, as well as individuals for domestic and social purposes, are beginning to use it. For instance, Mr. Chubb notifies, through public advertisements, that in case any person should have left the key of his safe or desk at home, by telegraphing to him he will send a duplicate to any address. Tradesmen, again, inform their customers that they may give their orders free of charge by means of the telegraph. In order to foster this branch of business, messages at the rate of one hundred for twenty shillings are now issued. As the head office in Cannon Street (City) is in communication with all the electric lines both land and submarine, these district offices may be considered as not only for the use of the metropolis, but as gathering-points for the country and continental telegraphs. The London District Telegraph Company have been laying out private wires for the use of individuals requiring to telegraph between their own establishments, but this is a line of business in which they cannot compete, we think, successfully, with the

Universal Private Telegraph Company, for reasons which we shall explain.

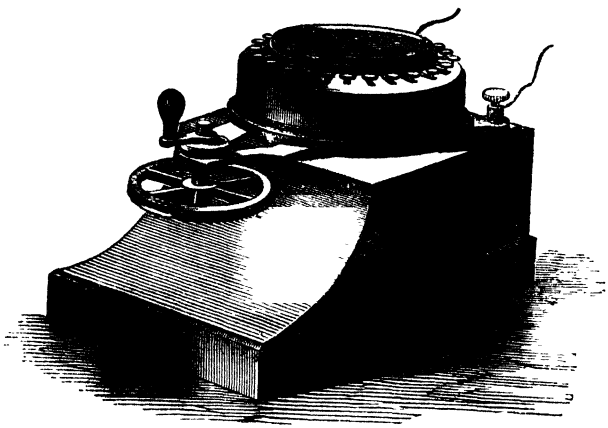
The Universal Private Telegraph Company make no outward sign like the District Company; indeed, they have no points of contact with the crowds who pass along the streets. The Company simply undertakes to put the merchant's country-house in direct communication with his office, houses of business with their branches, public offices with public offices; in fact, its mission is to supply renters with so many miles of *private wire* to run between house and house at a given price, and to provide telegraphic apparatus which can be worked by persons in the office, or counter, or drawing-room, as the case may be. Of course, it would be impossible profitably to provide a separate wire with its appropriate suspending posts to every renter at any reasonable price. Consequently, a system of combined action has been adopted for which Professor Wheatstone has taken out a patent. For instance, supposing that a hundred renters of wires lie on either hand of some great main thoroughfare, these hundred wires, for such a distance as they can be conveniently made to run together, are enclosed in one cable, carefully insulated from each other by india-rubber. These cables are so arranged as to form nearly equilateral triangles, each angle having a base of nearly a mile; the cable, however, being supported by wires slung from posts erected on the tops of the houses at every two hundred yards. At the intersection of every angle a mile apart, straining posts are erected for tightening the wires and for



giving each individual wire its direction of departure. If the spectator only observes one of these posts, he will see that it gives off filaments of wire in every direction: these private wires, having come along the cable in common with others for a given distance, are now making their way down into the offices and houses of their renters in the most direct way they can consistently with the triangular system of laying out the lines we have mentioned. Although a hundred wires are in some instances embedded in the same cable, the Company find no difficulty in discovering immediately the fault that may occur in any one of them, as at every two hundred yards the suspending pole is provided with a connecting box or plate pierced with small holes, through which every

separate wire, going or returning, spreads out from the cable, and having thus passed, is bound together again on the other side and proceeds to the next point.

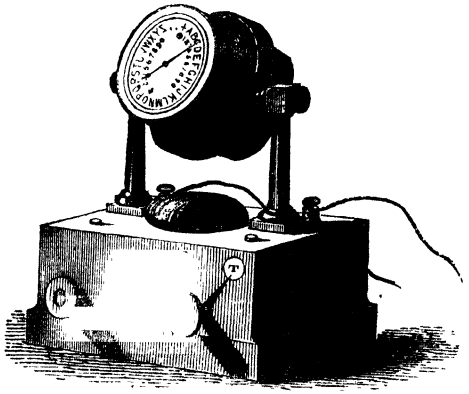
These holes are all numbered; consequently any failure of the electric current can be narrowed to a distance of 200 yards, and at once set right. By this system of telegraphy the communication is instantaneous; there is no waiting until other messages have passed, for the simple reason that no one else but the renter can possibly use it. Its speed is also greatly in its favour; as many as 150 letters a minute can be telegraphed by a nimble hand, whilst any person can send and read messages by it. The needle telegraph used by the skilled operators on the long lines is perfectly unintelligible to the uninitiated; but the



The Communicator.

child who can spell is as capable of sending a message as the *expert*, when these simple telegraphs of Wheat-

stone are employed. The Communicator looks like a small clock, with the twenty-six letters of the alphabet and the nine numerals inscribed on its face; each of these letters and numerals is moved by a small lever. The person telegraphing, by pressing down the pedal or lever attached to each letter, sends a pulse of electricity through the length of wire, which makes a needle point to a similar letter on the face of an Indicator at the other end of the wire, which is being watched by the person receiving the message. We may remark here that it has been objected that unless a person is always in the room where the message is received, and whose attention would have been attracted to the Indicator by the ringing of its bell,



The Indicator.

that messages would in these private transactions often be told to the barren air; but Professor Wheatstone has just completed a most extraordinary instrument, by which messages are printed in ordinary letter type on slips of tinfoil, and no human receiver

is at all necessary: all that a man has to do when he comes into his room, is to unlock a box and take out the roll of tinfoil, and read the message that has been sent in his absence. This automatic action, which acts perfectly, is one of the most astounding things in the world; and the self-acting printing-box, to any uneducated person, must look like nothing else than magic. The private telegraph of this Company is becoming a necessity of every large public or private establishment having separate places of business. All the Government offices are about to possess them. The different stations of the Fire Brigade are thus bound together; and the police-stations are similarly connected. At the time of the great fire in Tooley Street, on which occasion an excited and densely-packed crowd completely prevented the passing of any messenger through it, these telegraphs did immense service in enabling the authorities to hold in their hand the means of instant communication with distant divisional station-houses. In case of a serious riot it would be invaluable, as the wires could not be cut unless entrances to the private houses over which they passed were first obtained. M. Reuter has not been slow to see the advantages of these private telegraphs, as by their means he sends his telegrams directly into the editors' room of nearly every daily paper in London. The London and Westminster Bank is now in instant communication with all its branches, and the importance of this new agent in banking affairs will most certainly be seen and followed by all the other houses. Even medical men

have laid them down, or rather hung them up, between their private houses and consulting-rooms.

It is but due, however, to the enterprising North to say that the great merchants in its teeming cities have been the first to promote the further extension of the system, not only between house and house, but between town and town. Thus, nearly all the great manufacturers in the towns surrounding Manchester possess private lines of telegraph with each other, and with the central capital around which they are grouped. In Liverpool and Glasgow cables are radiating in all directions, to the thickly populated neighbourhoods in their vicinity. Indeed, before long, these private telegraphs will be as universal as the use of bells, and the time is not distant when, so far as great public and private establishments are concerned, everybody will be able to talk with everybody without going out of the house. We may state, in conclusion, that there is no possible connection between the wires of these two Companies, except as the effect of mere accident. Thus, on one occasion, an uninsulated filament descending from one of the cables belonging to the Private Telegraph Company, broke, and fell across one of the naked wires of the District Telegraph Company. The consequence was a violent quarrel between the private sender of the message and the public receiver, on to whose wire the errant message had wandered; but these incidents belong rather to the curiosities of Telegraphy than to the ordinary incidents connected with the rivalry of the different Companies.

HOSPITAL DISTRESS.

THE foreigner who looks into the advertising pages of the morning papers, cannot fail to be struck with the apparently bankrupt condition of our London Hospitals. Day by day a column and a half of most urgent advertisements assure the public that, unless immediate aid is given, half their wards must be shut up. Side by side with these begging appeals are to be found others, equally pathetic, imploring aid for the completion of hospitals the necessity for which is more than doubtful.

But let us ask in sober calmness, what is the cause of the growth of "charitable" bricks and mortar, and what is its tendency? To read the carefully worded advertisements, it would appear that hospitals, in the metropolis at least, were erected solely on the behalf of suffering humanity; and that the more we build, the better for society. Anyone who knows anything of the working of our metropolitan charitable institutions, is fully aware how far this is from the real—and we must add, in too many cases, the vulgar—truth. It is noticeable that most of our new hospitals are dedicated to the treatment of special diseases;

and it is further observable that most of these have originated in the energetic action of some individual. The germ of such buildings is the Dispensary. An energetic surgeon makes up his mind to step to fame and fortune by means of bricks and mortar. But, first of all, he must hit upon some striking speciality —the "Dispensary for the Treatment of Inverted Eyelashes," for instance. A quiet house is taken in a side street, patrons and patronesses are canvassed for, and in an incredibly short space of time a goodly sprinkling of the aristocracy have been found to pledge themselves to serve suffering humanity and Mr. ——, in the matter of inverted eyelashes. There is an annual list of subscribers, and the accounts are of course audited; but possibly a more searching inquiry than *dilettante* auditors are likely to give would prove that Mr. —— in his account with poor humanity has much the best of it. This goes on for a certain number of years, when it is found that eyelashes are becoming inverted in alarming numbers; indeed, there are carefully got up statistics to prove that every tenth person is suffering from this terrible disease, the study of which needs a larger sphere than the Dispensary, with its 20,000 (!) cases per annum, can possibly afford — in short, the dispensary bud must expand into a hospital. There are certain persons who seem to have been born only to be manipulated out of their money for the erection of new hospitals. It may be incontestably proved that inverted eyelashes can be treated in the old-established hospital close at hand; but that fact seems never

to have entered the thoughts of the gentlemen and ladies who so obsequiously follow the lead of the ambitious Mr. ——, who is determined that there shall be a building devoted to nothing but misplaced eyelashes, and perhaps—but this is of course quite under the rose—to himself.

In due course of time, the special hospital is completed. The old woman who used to sweep out the Dispensary is converted into the proud hall-porter; the small table in the back room is developed into the ample board-room; the matron and the house-steward stand in respectful attitudes; and Mr. —— is proudly conscious of the pinnacle of human greatness that he occupies (in his subordinates' eyes at least), when the Board become perfectly conscious that the "establishment" is eating up all their means, and that, unless "a charitable public," &c., come forward, thousands of inverted eyelashes will be left to their miserable fate. Such is the history of half the special hospitals at present existing in the metropolis. Founded in the grossest self-seeking on the part of some individual, they are matured only through a system of mendicancy already strained to the uttermost, and which sooner or later must give way.

But let us ask,—Do these special hospitals subserve to the education of pupils? Most decidedly not. Their tendency is to starve the general hospitals, where the schools are established, of that variety of cases which is so instructive to the future practitioner. Moreover, this splitting up of specialities

with a more than Egyptian minuteness has a tendency to destroy that unity of disease which the philosophic mind should always keep in view. The hospitals for inverted toenails and for inverted eyelashes may turn out clever operators in their very confined departments of surgery; but they will never furnish great surgeons, or advance the art beyond mere manipulative smartness.

There are certain large specialities, of course, to which our argument does not apply; but these exceptions must be patent to the reader. It is in surgery, more than in medicine, that we have erred in this respect. Independently of the scientific and educational evidence against these trivial special hospitals, there is the one great financial reason, that they squander the means of the charitable. Every one of these petty hospitals has its working staff, besides the building itself, the expense of keeping up which, in many cases, is the chief charge which tender-hearted and humane people are called upon to pay. It is this useless multiplication of machinery which is tending to exhaust the purses of the charitable, and to bring the principle of voluntary contribution into bad odour; and we most heartily hope and trust that our great provincial cities and towns will, in this respect, look upon our London practice as a matter to be avoided, rather than to be servilely followed.

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THE BREAD WE EAT.

ANY one who travels along the bye-streets of London comes now and then across what is called a "cutting baker's shop." If he be a family man, and knows the current price of the four-pound loaf, he is surprised to find the "cottage" and "tin" that he sees marked up in the shop-window, sold at a penny or twopence lower than he is in the habit of paying at home. If he goes in and examines the staff of life, he is struck with its whiteness and apparent fineness. At first sight it would seem that the poor man got a better article for less money than the rich and well-to-do classes; but a little inquiry into the method by which these cutting bakers "make things pleasant" soon dissipates this seeming anomaly. The size of the loaf, for instance, is by no means commensurate with the amount of nutriment it contains, for the simple reason that it may be made with more or less water. The cheap baker, for the sake of pumping up his loaf to the biggest size, mixes his dough very thin, and, by only three-parts baking it, makes the steam swell it enormously. Consequently, the poor man who buys new bread pays, say sevenpence or sevenpence half-

penny a pound, for so much steam. These puffy loaves, again, are generally made with damaged flour, which will not by itself make a white loaf; to correct this, alum is added, which so whitens the bread that it looks even fairer than that made from the best wheat: indeed, great whiteness in the household loaf must always be looked upon with suspicion. This process of mixing the thin dough, and then imperfectly baking the loaf, not only takes in the poor man, but enables the baker to make more loaves out of a sack of flour. The conscientious baker makes, on an average, ninety loaves out of a sack; the under-seller, however, manages to turn out from ninety-four to ninety-six. If he makes ten sacks a week (a low average), he thus fraudulently obtains some fifty four-pound loaves over and above the respectable baker. This will account for the fair appearance of the bread in the windows of the "cutting baker," and also for the sensation announcements posted in their shops: "Down again," "Bread a penny cheaper," which in many cases may be read "more water in it." The process of adulteration by means of alum is not only a fraud upon the purchaser, but also positively injurious to all delicate adults and young children; indeed it is the sole cause of nearly half the troubles of babies fed upon bread and milk, since the astringent nature of the alum entirely deranges the digestion of their delicate stomachs. Further, as a rule, the cheaper the bread, the more of this deleterious substance is to be found in it.

Yet now and then it is to be discovered in the

bread of the most respectable bakers. When Dr. Hassall's analysis of bread appeared in the *Lancet*, some of the most respectable men in the trade were surprised to find that he had detected alum in their loaves. Knowing they were innocent of putting it in during the process of baking, it occurred to some of them to have the flour analyzed; and lo! the delinquent turned out to be the miller—a well-abused individual from the earliest ages.

But even these impurities are found to form only a small part of the charges laid at the door of the master baker. The journeyman has for years groaned under a system of extreme labour calculated to break down the strongest constitution. As a general rule he labours, with slight intermissions of sleep, from eighteen to twenty hours a day, but on Fridays he often works for a day and a night together. This slavery, combined with the unwholesome nature of the occupation, which renders the baker's trade one of the most unhealthy trades in existence, led some short time since to the men's grievances being laid before Parliament, and to the appointment of a Commission to inquire into the condition of journeymen bakers and bakehouses generally. The Report of the Commissioner, Mr. Tremenheere, has been laid before Parliament, and now, in the form of a Blue-book, has given us such a sickening as we never experienced in crossing the Channel in the roughest weather.

We do not, as an inspired writer says, "live by bread alone;" and, according to the Report, it is well that we don't. The corn comes out of the ground,

and the bread comes out of the ground—or, at least, from a fœtid basement,—but the one is turned into nutriment by the aid of the refuse of the animal body; would that we could say the same of the other! There are some subjects so disgusting that there is no excuse for the bad taste that dwells upon them in the press; but we feel that the full force of public disgust is required to reform our present system of bread-making. Paterfamilias, when he cuts the loaf for breakfast on the Gothic wooden platter, surrounded by some highly spiritual motto, is certainly not aware of the physical impurity he is manipulating. But it is well that he should know the whole truth at once, for the remedy lies in his own hands. It is scarcely necessary to say that the art of bread-making has not advanced in the least from the condition it was in thousands of years ago. If the reader would verify this assertion, he has only to look at the process of bread-making as represented on the Assyrian marbles in the British Museum. We make the toys our children play with, the pins we use, the pens we write with—the smallest items, in fact, that are called for by our civilization—by the most elaborate machinery; yet the bread we eat is made by the naked arm, the rough hairy arm of the not over-clean workman.

Everybody knows the whereabouts of a London bakehouse by the indescribable hot odour that comes up the gratings; but we are not all permitted to see the den whence issues the main food of the people. We must, therefore, depend upon the descriptions of Mr. Tremenheere. In all cases there is defective ven-

tilation; in many cases the most polluted drains are to be found in the bakehouse itself; and as the ovens are generally placed in the cellar under the pavement, the inevitable result is that the foul air in its draught towards the fire is drawn over the dough while it is being manipulated. In many bakehouses the heat, often at 90°, causes the apartment to swarm with rats and mice, beetles, ants, and even worse vermin; and its action on the human skin during prolonged exertion may be imagined. Now, the first process of bread-making — the kneading process, or "making the dough," as it is called, — is a very laborious piece of business. The kneading process is carried on in a trough, the dough having to be turned over and over and thoroughly mixed with the bare arms. If you can imagine, good reader, a person making a bed at the bottom of a bath, the bed being very weighty, and the operation being carried on for half an hour in a temperature of 90°, the person leaning over the process the whole time, the inevitable result must be a copious perspiration which flows from the face and arms and drops down into the dough—"plenty of it," as one of the witnesses says,—and becomes incorporated with the bread. This sickening process is inseparable from the handicraft; and we may say, without fear of contradiction, that no loaf we eat, or that any one eats, from the Queen to the beggar, is free from some admixture of this vile animal impurity. But this is not all: one witness, James Reilly, says, "After the dough is made the journeymen first rub their arms out,"—*i.e.*, get off all the

dough they can by rubbing, and using dry flour to remove what adheres; after that they wash off the rest in a pail. If they are not looked after they will throw this away; "*but a careful master keeps it, and compels them to use it in the next batch,* with the rest of the water used in making the dough." Item, as old Pepys would say, beware of the "careful" master baker.

But these exudations of the human body are by no means all the impurities the dough contracts whilst in the process of being made into bread. After speaking of the heavy festoons of cobwebs which hang from the roofs of many bakehouses, and which become detached by a heavy blow on the floor above, and fall into the mixing trough, the Commissioner goes on to say, "Animals, such as beetles, ants, and cockroaches, in considerable numbers, crawled in and out of and upon the troughs where the bread was made, and upon the adjoining walls. . . . . The smells from the drains were very offensive, the draught of the oven continually drawing the effluvia through the bakehouse."

On this point Dr. Ure says, "If we reflect that bread, like all porous substances, readily absorbs the air that surrounds it, and that even under the best conditions it should never, on that account, be kept in confined places, what must be the state of bread manufactured in the manner common in London?"

What indeed! This paragraph was written by Dr. Ure many years ago, but still we have gone on

eating our "peck of dirt" with a most praiseworthy perseverance, and in all probability should continue to do so but for this Report, and the fact that, almost simultaneously with its appearance, mechanical science has stepped in to remedy the evils it makes us acquainted with. It is a fact that in most public charities and establishments, such as workhouses, blind asylums, and orphan schools in the neighbourhood of the metropolis, the inmates are supplied with machine-made bread, quite free from the disgusting impurities with the details of which we fear we have sickened our reader, while at the same time the most delicate and fastidious members of the community are still depending upon the bakers' bare arms for the bread they daily eat. Mr. Stevens has now had for some time a very effective machine for the making of bread, by which the whole operation is performed without the aid of the hand at all. This is a very useful apparatus, and is made to suit the requirements of both large and small bakers, and even private persons who love home-made bread. This machine, however, is calculated to make fermented bread only — food which strong stomachs can manage well enough, but which those suffering from dyspepsia cannot so conveniently digest.

The public are now pretty familiar with the aërated bread, the invention of Dr. Dauglish. This bread is also made by machine, it is not raised by the ferment of yeast, but by the introduction of carbonic acid gas into the dough whilst being mixed in an exhausted receiver. The carbonic acid

gas in this manner becomes thoroughly incorporated with the elements of the bread, and as it issues from the machine the gas gives it that highly vesicular appearance on which its extreme lightness depends. Flour, salt, and water are thus the only ingredients to be found in the aërated bread. But the purity of the loaf made by this process is not its only recommendation to weak stomachs. The flour from which it is made is prepared by an American process, which removes the outer coat of the grain—a silicious matter wholly indigestible—without injuring or removing the internal coat, which is the most nutritious part of the grain. By the ordinary method of grinding, this coat disappears with the bran, and thus at least twenty per cent. of the value of the wheat grain is lost. The flour, thus rich in what is termed "cerealine," by the ordinary process of bread-making, however, turns out a rather brownish loaf, to which the public, as a rule, object, as it is supposed to exert certain laxative qualities, after the manner of the well-known brown bread. Now, although this is an error (the peculiar properties of the brown bread depending upon the silicious coat which is retained in it, whilst it is rejected from this new preparation), yet the public cannot be convinced, and the invaluable process of unbranning wheat would have been rejected but for the simultaneous invention of the aërating machine which Dr. Dauglish has brought before the public. The aërated loaf made from this exceedingly rich flour having no fermenting process to go through turns out a beautifully white

bread, which is certainly the pleasantest, whilst it is the most nutritive, of all kinds of food made from the wheat grain. Some time since, the aërated bread was all made at the extensive steam bakery of Messrs. Peek, Frean, & Co., at Dockhead, Bermondsey. The distance from the west-end consumers of the new bakery made the difficulty and cost of distribution so great, that it was necessary to come to some other arrangement. Consequently, Dr. Dauglish, instead of concentrating his manufacture in one place, determined to set up separate bakeries in different centres of the town. Three bakeries of this description are now at work — one at Islington, one at Hackney, and one at Kennington Park, and these will speedily be followed by other establishments in different quarters of the metropolis, and thus the difficulty of distribution, which prevented many from procuring the bread who really preferred it to all other, will be superseded. The complaint of the journeymen bakers against the long hours of work, and the foul conditions under which they labour, will be wholly disposed of by the introduction of these bread-making machines, as the work which formerly employed the men, off and on, for eighteen or twenty hours, can now be performed under two hours, and in a perfectly well-ventilated apartment; thus affording another instance of the value of machinery, not only by saving humanity much most offensive drudgery, but by eliminating those sources of disease which so often sacrifice the life of the workman to the necessities of our civilization.

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EXCURSION TRAINS.

As Excursion Trains have now as distinctly marked a season as any of the sports and pastimes of the people, we may perhaps be permitted a few words touching that development of the locomotive habits of the age. Far be it from us to disparage in any way that thorough ventilation of our population, so to speak, which has been one of the most notable results of the invention of railway-travelling. That the people of this island were existing in a thorough state of stagnation before Stephenson commenced his transformation-scenes with the locomotive, we know too well; and the experience of these last twenty years has given ample proof of the effect the Rail has had, in breaking up the condition of isolation in which every class but the very highest was placed before that period. It would ill become us, therefore, to speak ill-naturedly of excursion trains, which bring the advantages of this great invention to the doors of the very lowest of the artisan class. But we cannot help, at the same time, seeing that some very grave disadvantages accompany the present method of airing our holiday

people, and of interchanging for the day our rural and urban populations.

We may liken a railroad, with its various branches and the rolling stock at work upon them, to one great machine — the different trains forming as much a portion of the instrument as the piston-rod forms a portion of a steam-engine. The exactitude with which these trains keep their time is also as essential to the good order of the traffic as a whole, as would be the exactitude with which one of the driving-wheels kept time with the other. This being the case, what shall we say to the temerity of Directors who, in working this delicate machine, the combined movements of which, to insure the safety of its living freight, depend upon a clock-like regularity, drop into it with deliberate carelessness a disturbing element, the shock of which is felt throughout its entire frame-work, and which throws out the precision of time so requisite for its safety? Is it not as foolish a thing to do as it would be to drop a screw into the works of a chronometer? or rather, is it not a far more foolish thing?—for, in the one case, only delicate workmanship is at stake, in the other, human creatures' lives.

Whenever the Directors of a railway start an excursion train they commit this error. The time of the regular traffic of the road is entirely thrown out for the day; and in many cases lives are jeopardized where, through the abrupt curves of the road or the ill working of a switch, this disturbing element makes its appearance at distant parts of the line at unlooked-

for moments. It may be said that these excursion trains should be made such regular irregularities, that their amount of disturbance would be a fixed quantity, to use a term of the physicist; but all those who have watched the manner in which these monster trains are despatched, and have noticed the habits of that class of people who travel by them, will at once understand how hopeless it would be to attempt any order or method in their despatch, or to look for any possibility of their starting by an appointed time. In the first place, the officials themselves seem wholly incompetent to deal with the enormous pressure of the crowd which the announcement of a cheap trip calls to their platform. A sudden irruption of fifteen hundred or two thousand people is met by the ordinary staff at the station of departure; and the consequence is a most awful confusion, which is increased into a scene of yelling and fighting that would scarcely be believed, when the one clerk opens the one cheque-taking window, and the fight for tickets commences. This want of all proper arrangement would in itself be sufficient hopelessly to delay the departure of the train at the appointed time, were not that difficulty further augmented by the amount of *impedimenta* that the "cheap trippers" and "excursionists" invariably carry. The chief mistake of women on these occasions is in the number and the helplessness of the babies with which, by way of taking pleasure, they encumber themselves; and the less amiable weakness of the men is for four-gallon jars filled with beer. These, the more lively elements of enjoyment, are placed in

the foreground; but the solid food, without which the Briton of a certain class cannot move five miles from his door, is not wanting. The general state of bewilderment, also, which appears to take possession of the cheap-tripper the moment he puts foot into the station, together with the unwieldiness of his belongings, render him the most difficult animal to "embark" that can well be conceived. But there is yet another element of delay in excursion trains,—the difficulty the officials have in estimating the number of riders they will have to provide room for,—a difficulty which is generally met by simply building up the train to meet the requirements of the multitude pouring in upon them. As this system of building up the train is generally allowed to progress at a pace suited to that of the most dilatory or the most baby-burthened mother, and as length seems to be of no account, it is not surprising that a monster excursion train often starts as late as two hours after the appointed time; and when it finally draws its slow length along from the platform, it is seen that the people in this pleasure excursion are designedly placed between an engine at the tail of the train and two in front. Now let us imagine the state of excitement which the passage of such a train as this must cause; the strain which is put upon every station-master, pointsman, and guard, along a hundred and twenty miles of rail, having to provide against accidents to intermediate trains whilst this excursion train is whizzing about the country at no given time. Imagine fogs coming on (and the foggy month of September is generally chosen for

excursions), when signals are of no avail; and then consider if the chances of excursion trains coming in collision with express trains, which generally have to pass them on the same line, are less than passengers on board steamers have of shipwrecks from icebergs or the rocks of Cape Race! Indeed, it is to us a most extraordinary thing that, with these excursion trains flying across and athwart the island in every direction, we do not hear more of serious accidents to railway travellers than we do.

But, it may be asked, cannot we in any way avoid the causes of danger and disturbance which at present render excursion trains such a nuisance to the ordinary railway traveller? It seems to us that the difficulty of obtaining tickets may be obviated by issuing them a day or two beforehand. Railway companies may urge that this plan would not answer, as holiday folks would like to make sure of a fine day before investing their money in a ticket. If this really be a valid objection, the only way to meet it would be to distribute the tickets when the carriages were in motion. By so doing very much valuable time would be saved, and one element of danger would be eliminated. It is quite clear that the system of adding carriage after carriage to a train, until it attains a length which is unmanageable without the aid of a locomotive to push behind as well as to pull, should be entirely prohibited. The multitude who trust themselves to a train so propelled are placing their lives between an upper and a nether millstone; and if a stop be not put to this most perilous method

of progression, some catastrophe will inevitably happen, to which those we have already experienced will be as nothing. It immediately suggests itself that the difficulties attending these monster trains may be avoided by breaking them up into two or three trains; but this would only be to multiply the chances of danger, unless the intervals between the starting times were amply sufficient to prevent the chance of their overtaking each other. But even then the auxiliary aid of the telegraph would be needed, in order to insure the safe passage of a quick succession of trains, treading upon each other's heels as it were. The frightful accident that happened to an excursion train on the Lynn and Hunstanton Railway, by which five persons were killed and five-and-twenty more or less wounded, was an example in point. It appears that one of these excursion trains was started a quarter of an hour only after the other; the first train passed a bullock on the line, but the driver seemed to take no notice of it; at all events, he did not inform the station-master of the next station he arrived at; consequently no warning was given by telegraph to the on-coming train. The result of this was, that a collision with the beast threw the carriages off the line, and unfortunately it was not in this case the worse for the "coo" only, as old Stephenson predicted would be the case under such circumstances, but for the poor excursionists also. Perhaps, after all, the most efficacious means of correcting the delays and inconveniences that are caused by these excursion trains, which interfere so greatly with the ordinary

traffic of the line, would be to make arrangements for their being started at a separate platform and siding, which should be provided at the railway terminus, entirely independent of that used for the ordinary traffic of the station, as well as for the employment of a staff of clerks, police, and porters, who should be specially told off for this particular work. If this were done, and a sufficient telegraphic communication were kept up between train and train, it seems to us that the danger and the nuisance which confessedly arise from the system of excursion trains would be very much abated, though not perhaps entirely removed. It is quite clear that, as things are at present managed, Sunday excursion trains are by far safer than those that run during the week, inasmuch as they have the rails comparatively to themselves on that day. And this, so far as we can see, is a very practical argument against the entire abolition of those Sunday excursion trains.

EARLY WARNINGS.

THE spirit of man is ever busy pushing his investigations farther and farther into the secret workings of Nature—step by step he is tracking her into her inmost recesses; and if he despairs of ever reaching the final cause of things, he at least is rewarded by the ample knowledge and subtle beauty he finds on the way. Before the microscope was discovered, what realms lay unknown at his feet! The mind has no microscope, it is true, by which immaterial things can be tracked upwards to their source; but its penetrative powers grow vastly subtle by the habit of concentrating them upon any particular study, and the merest trifle to the educated eye assumes proportions not to be estimated by the superficial observer. We remember hearing it said of the late Dr. Marshall Hall, that he could not bring his acute and persistent mind to bear upon a gooseberry without finding out some fact and deducing some great truth from it that had never struck any person before. Of late years the science of mind, healthy and diseased, has been placed, as it were, in the field of the intellectual microscope, and since the appearance of Dr. Abercrombie's "Inquiries

Concerning the Intellectual Powers," which created such a profound sensation thirty years ago, numerous investigators have been engaged in following up the clue he placed in their hands. That there is an immense amount of latent brain disease in the community, only awaiting a sufficient exciting cause to make itself patent to the world, there can be no manner of doubt. In the Annual Reports of our Lunatic Asylums, we see tables of the causes of the insanity of the inmates, which would lead the public to believe that certain powerful emotions were sufficient to disorganize the material instrument of thought: thus we find love and religion figuring for a very large proportion of the lunacy in our asylums, whilst a fire, a quarrel with a friend, are set down as the causes which precipitate an individual from a state of sanity to madness. We do not mean to say that any sound psychologist imagines that these causes are anything more than proximate ones, but the public, and possibly medical men little versed in mental alienation, seem to think that a healthy mind can be suddenly dethroned by some specific emotion, just as a healthy body may be suddenly prostrated by fever. There is, in fact, no such thing as sudden insanity, or at least it is of the rarest possible occurrence. Coroners' juries may imagine that a person who has committed suicide became insane only at the moment of inserting his neck in the fatal noose, but every one who has studied the human mind must be aware that it is not constituted like a piece of cast-iron, which snaps suddenly under the influence of a

sudden frost. The grey fabric of the brain, before it gives way, always affords notable signs, easily capable of being read by an accomplished physician, of a departure from a state of health.

It often happens that impending lunacy is known to individuals themselves long before any sign is made to others. There is a terrible stage of consciousness, in which, unknown to any other human being, an individual keeps up, as it were, a terrible hand-to-hand conflict with himself, when he is prompted by an inward voice to use disgusting words which in his soul he loathes and abhors: these voices will sometimes suggest ideas which are diametrically opposed to the sober dictates of his conscience. In such conditions of mind prayers are turned into curses, and the chastest into the most libidinous thoughts. It does not necessarily follow, because a man is thus haunted by another and evilly-disposed self, that he has reached the stage of lunacy, if his reason still retains the mastery. It is said that Bishop Butler waged, for the greater part of his life, a hidden warfare of this kind; and yet no one ever suspected him of unsoundness of mind. It is indeed strange what wayward and erratic turns the mind will take even in robust health. For instance, every one must have felt the difficulty now and then of suppressing the inclination to cry out in church, or to prevent the rebellious muscles of the face from expressing a smile on occasions when the utmost gravity of demeanour is called for. Again, we are often haunted by an air of music, or some voice will repeat itself with such

obstinacy as to annoy and distress the mind, and often to prevent sleep. These curious phenomena are not symptomatic of brain disease, but they are singular examples of transient conditions of mind, which, when persistent, are clearly allied to insanity. When, however, this persistence in morbid thoughts does arise, a man may be sure that he requires the attention of his physician, and that there is some cause at work which is breeding mischief; unless he does this, the probability is that the malady will take a more serious turn, and that the voices, before believed to be internal ones, will appear external, and lead the unhappy sufferer to desperate courses.

Possibly the stage of consciousness is the most terrible of all the conditions of mind which lead the way to insanity. The struggles with the inward fiend which the reason finds that it cannot exorcise, must be far more appalling than a condition of absolute madness, in which very often the mental delusions are of a pleasing character.

A patient, writing to Dr. Cheyne, says: "Such a state as mine you are possibly unacquainted with, notwithstanding all your experience. I am not conscious of the decay or suspension of any of the powers of my mind. I am as well able as ever I was to attend to my business. My family suppose me in health; yet the horrors of a madhouse are staring me in the face. I am a martyr to a species of persecution from within which is becoming intolerable. I am urged to say the most shocking things; blasphemous and obscene words are ever on my tongue. Hitherto,

thank God, I have been able to resist; but I often think I must yield at last, and then I shall be disgraced for ever, and ruined." Dr. Wigan gives an account of a worthy but poor clergyman, who was possessed, as it were, in this manner, when he was suffering from over-study or want of rest. At these times, when preaching, there would seem to be placed before his eyes some profane book, which the devil tempted him to read in lieu of his sermon. This was a case where the brain was suffering from a want of duly arterialized blood, as he found that violent exercise with the dumb-bells effectually cast out the fiend which tormented him. Exhaustion of nervous power, over-work, anxiety, or other causes, is, we believe, the spring of mental distress of this nature to a much greater extent than the public apprehend. In this age, when the race is neck-and-neck, and the struggle for life is ever straining men's minds to the breaking-point; when the boy has to go through an examination for a clerkship of a more severe character than was demanded for a university degree of old; when the professional man serves a seven years' apprenticeship to Science, and but too often a second seven to Starvation, is it to be wondered at that the mental fibre becomes weakened, and unable to resist the strain of any great excitement or further process of exhaustion?

It too often happens that the stage of consciousness is allowed to progress unperceived—the unfortunate sufferer concealing the agony that is eating into his very soul with the utmost jealousy from the wife of

his bosom, and from his dearest friends. We have no doubt in our own minds that innumerable acts which appear totally unaccountable to friends and strangers are the results of mental conflicts hidden in the depths of the patient's mind. In such cases the demon in possession would seem to select those very moments in which the enjoyment of other men is found: at the festal board, in the moments of conversation with friends, in the company of ladies, when everything is *couleur de rose*, this conflict will sometimes rage the fiercest, and lead the would-be placid partaker of them to sudden movements or fits of abstraction which puzzle and confound those who watch his conduct. And yet, in the great majority of such cases, medicine (and by this term we use the phrase in its largest sense, such as change of scene and air, and rest, with proper medicaments) is potent to exorcise the foul fiend, and to restore the sufferer to his usual mental health. The dependence of the mind upon the body is often proved in the most unmistakable manner in such cases. A single prescription, like the Abracadabra of the Magician, will convert the man on the verge of insanity to his old serenity of mind. An anecdote is told of Voltaire and an Englishman which admirably illustrates the position. The conversation between the two happening to turn upon the miseries of life, the *ennui* of the Frenchman and the spleen of the Englishman both so far agreed that they decided that existence was not worth having, and they determined to commit suicide together on the following morning. The Englishman punctually arrived, provided with the

means of destruction, but the Frenchman appeared to be no longer in the suicidal mood; for, on the other proceeding to the execution of their project, Voltaire amusingly interposed, "Pardonnez moi, monsieur, mais mon lavement a très-bien opéré ce matin, et cela a changé toutes idées là."

Feuchlersleben, in his "Mental Physiology," has very subtly said, that if we could penetrate into the secret foundations of human events, we should frequently find *the misfortunes of one man caused by the intestines of another!* This may appear a phantastic proposition on the part of the learned German; but do we not, as men of the world, act upon the knowledge of this fact every day of our lives? Who would be fool enough to ask a man a favour whilst he was waiting for his dinner? The irritation Paterfamilias labours under during these few minutes is clearly attributable to an impoverished condition of the blood; it is, in fact, a fleeting attack of that temper-disease which Dr. Marshall Hall has proved is an abiding condition of some persons—particularly among the female sex. How many professional men, wearied all day by press of business, their blood poisoned by sitting for hours in the dark stagnant air of city chambers, will resume their work after dinner, and even prolong it into the night? How many clergymen, ambitious of distinction in the pulpit, will exhaust their brain by the incessant manufacture of bad sermons? Happy the man who retires behind his bandanna, and aids digestion and refreshes his brain by the legitimate forty winks. No man after middle

age, if he hopes to keep his mind clear, should think of working his brain after dinner, a season which should be given up to enjoyment. The immediate result of post-prandial labour is always inferior to that produced by the vigorous brain of the morning. When mental labour has become a habit, however, we know how weak are the words of warning to make a sufferer desist; and we are reminded of the answer made by Sir Walter Scott to his physicians, who, in his last illness, foresaw that his mind would break down unless he desisted from brain-work. "As for bidding me not work," said he, sadly, "Molly might as well put the kettle on the fire, and then say, '*Now, don't boil.*'"

It must not be supposed, however, that we wish to deprecate even severe mental labour; on the contrary, a well-organized brain demands exercise, and, like the blacksmith's arms, flourishes on it. We believe that pleasurable productive brain-work can be carried on to an almost limitless extent without injury. A poet in the full swing of his fancy, a philosopher working out some scheme for the benefit of humanity, refreshes rather than weakens his brain. It will be found that the great majority of those who have gained high honours in our universities have also distinguished themselves greatly in after-life. It is the hard, thankless task-work which tears and frets the fine grey matter of the cerebrum; it is the strain and anxiety which accompanies the working-out of great monetary transactions which produces that silent and terrible *ramollissement* which gradually saps the

mind of the strong man, and reduces him to the condition of an imbecile.

When we warn the reader to take notice of "early warnings," it matters not whether the symptoms are those which lead to the entire destruction of the motive force, and the obliteration of his powers of action, or whether it takes the road to the mere derangement of the moral and intellectual capabilities; if allowed to proceed unchallenged, they lead alike to the destruction of the individual as a free agent. They are equally brain diseases, for the old idea that there is such a thing as derangement of mind without any lesion of the instrument of thought, has long been exploded. This idea probably arose from the fact that, in the vast majority of the brains of the insane, when examined after death, there was no appreciable sign of change—nay, the brain has suffered very severe injuries and yet been followed by no symptom of mental disturbance. The changes that take place physically are of too delicate a nature for our science to reach in its present condition; but there seems to be no doubt that all abnormal mental phenomena depend upon some unhealthy state of the blood. Polished steel is not quicker dimmed by the slightest breath than is the brain affected by some abnormal condition of the vital fluid. In the horrible phantoms simulating the thoughts of the insane, which haunt us in nightmare, we have a familiar example of the manner in which an over-loaded stomach will disturb the mind; in the ravings of the insane consequent upon the drinking of salt-water in

cases of shipwreck; in the temporary effect produced upon the temper by waiting for dinner; and, finally, in the delirium attending fevers and drinking, we have other and equally well-known causes of mental disturbance inevitably following the absorption of some poison into the blood, or of the starving it of its proper nutritive constituents.

The more the fact of the physical nature of insanity is acknowledged—the more it is recognized as an ailment which can be reached by physical agents—the greater will be its chance of successful treatment. If a man shivers and feels depressed, he seeks his physician, that he might meet the coming fever with the best resources of his art. If a man feels his brain disturbed—if he feels the "early warnings" of which his friends as yet know nothing—would it not be equally wise of him to summon the aid of medicine before it is too late? Insanity, taken in its earliest stage, is more easily cured than many diseases which a man passes through without any great fear; for instance, we question if pneumonia is not far less curable than simple insanity that is not hereditary. If such a mystery were not made of mental disease, it would be deprived of half its terrors and of half its evil consequences at the same time.

Whilst we should be keenly alive to the first symptoms of a departure from an ordinary state of mind or habit, it must not be supposed that we see a madman in every individual who thinks for himself or acts in a manner different from his neighbours. We wish to drag no garden-roller, as it were, over

character, and to declare that any person who goes out of the general dead-level is to be suspected of being what is popularly called "touched." There are naturally crooked sticks as well as straight ones. If, however, a man habitually of an eccentric turn of mind were to become all at once like other people, and remained so, we should feel certain that some mental mischief was brewing. It is the sustained departure from a normal condition of mind and mode of life which should cause a grave suspicion of impending insanity. When we find a modest man become boastful and presumptuous,—a lover of truth transmuted into an habitual liar,—a person of known probity condescending to petty thefts,—a humane individual suddenly turned cruel,—and a cautious man wild, reckless, and extravagant,—then we may be sure that there is mental disturbance of a very grave character. The reasoning power may remain clear, and the intellect as bright as ever, and in the course of a long conversation friends may not perceive the slightest cloud upon the understanding. Nevertheless, the reader may be certain that these deviations of the moral sentiments are the switch-points which indicate the fact that the mind is leaving the main line, and that, if left to itself, it will speedily career to destruction. It sometimes happens that such changes of mind take place without their being made apparent even to the nearest friends; and that some trivial conversation or circumstance having led to a suspicion of mental unsoundness, upon inquiry it has been discovered that the individual has already half-ruined himself. Esquirel

mentions a case of this kind, the subject of which was a merchant of considerable position and fortune, whose hidden alienation of mind was brought to light by his having purchased at a high price some very inferior pictures; a dispute respecting their value thereupon arising with his children, he flew into a passion, and his insanity became evident. His children, alarmed at his condition, looked into his affairs, when they were found to be utterly in disorder, and full of blanks. This irregularity had existed for six months, and had there been no discussion respecting the pictures, leading to the discovery of the state of his mind, one of the most honourable mercantile houses in France would have been seriously compromised, for a bill of [illegible] of a considerable amount had become due, and no means had been taken to provide for its payment.

The latent seeds of insanity very often become known to the world through unusual physical signs. Muscular agitation succeeds to the ordinary repose of the individual. The man whose manner in a state of health is grave and gentle, suddenly puts on a brusquery which astonishes his friends. It would seem as though he sought to stifle his agonizing thoughts by the exhaustion of his physical strength. "In this state," says Dr. Winslow, "the patient resembles a ferocious animal removed from his native forest and confined in a cage. He paces and repaces the room, night and day, in a condition of extreme perturbation, rarely sitting or standing in a state of repose for many consecutive minutes. He suddenly starts from

home, being tormented by a peevish, irresistible restlessness—a constant, unwearied, never-satisfied desire for change; walking, unfatigued, long distances, with great apparent fixedness of purpose and accompanying vehemence of gesture, without having in view a sane or rational object. These rapid strides, forced and violent movements, appear to originate in an instinctive desire to throw off a morbid accumulation of muscular force. . . . . In vain the unhappy man struggles to obtain peace of mind by yielding to an irresistible and uncontrollable desire to rush almost unceasingly from place to place. Fruitless are his endeavours to arrest the creation of the morbid, gloomy imagery desolating and bewildering his thoughts. . . . Alas! he cannot fly from himself."

But these are the more prominent warnings of coming trouble which cannot well be overlooked. The symptoms we wish to draw attention to are those slight deviations from a normal condition which are but rarely observed either by the sufferers themselves or their friends. One of the most constant and characteristic is a debilitated power of attention. Possibly, the most comprehensive definition of genius is the power of concentrating and prolonging the attention upon any one given subject. It is the quality of the mind which raises one man above another, and it is the parent of all creations and of most discoveries; and, we may add, it is the morbid excess and indulgence of this quality which leads sometimes to mental disease: hence the common observation that genius and madness are only divided

by a very thin partition. The difference, says Sir William Hamilton, between an ordinary mind and the mind of Newton, consists principally in this,—that the one is capable of a more continuous application than the other; that a Newton is able, without fatigue, to connect inference with inference, in one long series towards a determined end, while the man of inferior capacity is soon obliged to break, or let fall, the thread which he had begun to spin. This is, in fact, what Sir Isaac Newton, with equal modesty and shrewdness, himself admitted. To one who complimented him on his genius, he replied, that if he had made any discoveries it was owing more to patient attention than to any other talent. There is, however, a certain morbid attention, when directed towards supposed ailments of the body and mind, which is to be especially deprecated. A man may so concentrate his attention on certain organs of the body as to produce disease in them. The hypochondriac, for instance, never ceases to dwell upon the condition of his digestive organs, and the consequence in the end is that he directs so much nervous energy to the spot as to cause congestion and actual disease. We see no reason to doubt that mere disordered functions of the brain may be converted by the same undue attention into positive disorganization. Hence, over-studiousness on these points is to be avoided. We have no fear that in the great majority of cases there is any danger of such a result; but in persons of a highly nervous temperament it is different, and with them the very first step towards health would be to enable them to get rid of

themselves. Of a very different nature to this exaltation of the faculty of attention is the exaggeration which often takes place of the special functions of sense. The approach of brain disease is often heralded by the most marvellous exaltation of sight, smell, taste, and hearing. Dr. Elliotson mentions a patient who, previous to an attack of hemiplegia, felt such an extraordinary acuteness of hearing, that he heard the least sound at the bottom of his house. The vision was also exaggerated to that degree that he could tell the hour by a watch placed on a table at such a distance as would, in a state of health, have precluded his even [illegible] the hands. In another case, a gentleman, previous to an attack of inflammation of the brain, remarked to his son that he could hear a conversation that was taking place in a distant part of the house, when those around him could not even distinguish voices. The sense of smell is often equally increased in force, and the slightest odours are exaggerated into the most disgusting smells. In this condition of brain the avenues by which the outward world is brought in connection with the inward man are thrown open so widely that it would seem as though the unhappy person projected his special organs of sense outward until they absolutely came in contact with the objects or manifestations submitted to them. A more distressing condition it would be difficult to imagine, or one which more clearly points to an inflammatory state of the brain. "In the incipient stages of the various forms of cerebral disease," says Dr. Winslow, "the sensibility is not only

heightened, impaired, and paralyzed, but it shows marked evidence of being vitiated. The patient complains of the existence of pricking sensations in various parts of the body, as well as of the existence of formication, particularly at the extremities of the fingers and toes. For some time previously to the development of well-marked symptoms of cerebral disease, a patient remarked that everything he touched was extremely cold. In some cases a gritty body, like that of sand, and a piece of cloth appeared to be interposed between the patient's fingers and whatever they came in contact with. Other invalids have affirmed that whatever they touched felt like a piece of velvet. Andral noticed this phenomenon. Six weeks before a paralytic attack, a patient complained of one-half of the scalp feeling like a piece of leather. In the case of a gentleman who died of apoplexy, there was for some time previously to his illness a feeling in both hands as if the skin were covered with minute and irritating particles of dust or sand. He repeatedly complained of this symptom, and was frequently observed to wash his hands, with the view of removing the imaginary annoyance. Impoverishment of sensibility in the arms, preceded first by a feeling of intense cold in the part, and subsequently of numbness, followed this perverted state of sensation. In another case, some time prior to a paralytic seizure, the patient imagined that he had extraneous particles of dirt and stones in his boots, or inside his stockings, irritating his feet, and interfering with his personal comfort as well as freedom of locomotion. This per-

verted state of sensation was observed for two months previously to his attack of acute cerebral disorder." A patient under my own care, suffering under symptoms of brain disease, fancied everything he touched was covered with grease, to get rid of which he was incessantly washing his hands; indeed, his whole body, according to his own account, was contaminated in the same manner, and in order to cleanse himself he was always taking baths. In fact, he lived in cold water, and yet always protested that he was as greasy as ever. Ultimately this gentleman was obliged to give up his appointment, and is now quite incapacitated for any employment.

To those unaccustomed to read the subtle indications by which the brain gives its warnings, these trifles light as air may seem to be of too trivial a nature to warrant the interposition of medicine, and those who venture to draw attention to them are liable to ridicule. On the occasion of the discussion on the Lunacy Amendment Bill not long since, the Lord Chancellor remarked the tendency of medical men to intrude their "theories" respecting insanity when acting as witnesses in the law courts. In confirmation of this opinion he read from Dr. Bucknill and Tuke's "Psychological Medicine" a passage which spoke of "a shrivelled ear" as being symptomatic of a certain mental condition. Now, curiously enough, this "shrivelled ear" and "bristling hair," which their lordships laughed at so immoderately, is a most undoubted sign of chronic dementia.

The premonitions of epileptic attacks are but too

well known to require attention at our hands, and they are at the same time so varying in their character as to preclude the reliance upon any one warning symptom. "Herein the patient must minister to himself." But the community is not aware that epileptic attacks may go on for years without discovering themselves either to the individual or to his friends or medical man. In children, especially, attacks sometimes come on in the night, and pass away without leaving any sign. Dr. Marshall Hall has done lasting service by drawing the attention of the public to this obscure form of a well-known disease, and the nursery is thus supplied with a hint of great use to the rising generation. These hidden seizures, however, sometimes take place in after-life; and the slightly bitten tongue, often so slightly indented that it is scarcely perceptible, is the only indication that a symptom of approaching brain disease of a severe type has visited the individual in his sleep. Strange as it may appear, however, the most marked and terrible seizures are sometimes mistaken by persons suffering them for the visitations of preternatural agents. Dr. Gregory, of Edinburgh, used to give a case of this kind in his lectures which is so curious that we shall here relate it. One of his patients told him that he was in the habit of dining every day at six, but that he was plagued with a visitor at that hour, who always greatly distressed him. Exactly as the hour struck, the door opened, and an old hag entered with a frowning countenance, and, with every demonstration of spite and hate,

rushed upon him and struck him a severe blow upon the head, which caused him to swoon for a time of a longer or shorter duration. This apparition, he asserted, was of daily occurrence. Dr. Gregory, guessing that some mental delusion was at the bottom of this singular attack, invited himself to dinner with his friend, adding, "We will see if your malignant old woman will venture to join our company." The gentleman gladly accepted the proposal, expecting, however, the doctor's ridicule rather than his sympathy. When the dinner arrived, the doctor exerted his powers of conversation, which were of a very brilliant character, in the hope of diverting his friend's attention from the thoughts of the approaching visit, supposing that he was suffering from some nervous attack, and he so far succeeded that the hour of six came almost unnoticed, and he was hoping that the dinner would pass without the unwelcome interruption. The clock had scarcely struck, however, when the gentleman exclaimed suddenly, in an alarmed voice, "The hag comes again!" and dropped back in his chair in a swoon, in the way he had described. These periodical attacks were clearly traced to sudden head seizures, which gave way to the appropriate remedies.

Whilst an exaltation of the faculty of attention points to insanity, the growing deficiency of it points as certainly to a coming imbecility, and especially of an impending attack of softening of the brain—that terrible affliction which may be termed the stock-brokers' disease, so liable do the *habitués* of Capel

Court seem to its visitations. The first beginnings of this disease very often come upon a man in the height of his prosperity, and its approach is so insidious that, although he may be walking about and transacting his business, this fatal rot may have already commenced. As in the "Vision of Mirza," a passenger is every now and then missed from the ever ebbing and flowing stream of life, and none but the physician notes that he has dropped through the pitfall on the bridge, and will never mix in the busy haunts of man again.

Dr. Winslow, in a few graphic touches, thus paints the onset of this sad condition: "In the incipient stage of cerebral softening, as well as in those organic disintegrations of the delicate nerve vesicle observed in what is termed progressive, general, and cerebral paralysis, the patient often exhibits a debility of memory (long before disease of the brain is suspected) in regard to the most ordinary and trifling matters connected with the every-day affairs of life. He forgets his appointments, is oblivious of the names of his most intimate friends, mislays his books, loses his papers, and is unable to retain in his mental grip for many consecutive minutes the name of the month or the day of the week. He sits down to write a letter on some matter of business, and the attention being for a moment diverted from what he is engaged in, he immediately loses all recollection of his correspondence, and leaves the letter unfinished. In this condition of mind he will be heard constantly inquiring for articles that he had carefully put aside

but a few minutes previously." The handwriting will often afford very conclusive proof of the failing mind of the writer, and we may quote that of a gentleman, whose case came under our own notice, whose correspondence thus betrayed him. On his being removed from business, it was discovered that for some time previously to any disease of the brain being suspected, his letters were found to be full of erasures, words misspelt, and calculations remarkable for their inaccuracy. At times, there was a recovery for a period of a week or so from these inaccuracies, which were altogether foreign to the nature of the gentleman when in a sound state of health. These temporary recoveries, however, were always followed by the blundering we have noticed, and he ultimately died of softening of the brain.

We are inclined to think that the sign of cerebral softening most to be dreaded is the want of power to fix the attention. A person might suffer from temporary loss of memory from very slight causes; such, for example, as exhaustion. Sir Henry Holland, in his very interesting "Mental Pathology," tell us that, having descended two deep mines in the Hartz Mountains, and having undergone much exertion without food, he found himself suddenly deprived for a short time of his memory, which returned again immediately after taking food and wine. A copious draught of wine will often restore these momentary fits of loss of memory, which are dependent upon no organic disease, but arise from a want of proper circulation in the brain. We all know,

when we have forgotten a particular name or thing, the pertinacity with which it seems to recede farther from the memory, the more we try to recall it to mind —it remains upon the tip of the tongue, but will not come forth. These are familiar examples of transient loss of memory, which only prove how often the healthiest brain is for a moment plagued with momentary symptoms of no account which, when persistent, are the invariable precursors of serious brain disease. There are certain significant, although but slightly-marked, signs of softening which tell clearly to the eye of the practised physician the approach of the disintegration of the cerebral matter. The trained eye will observe a loss of muscular power; the patient will slip on one side; the leg is put forward with great premeditation; volition ceases to act unconsciously; certain acts are performed as though the sufferer were pulling the wires of a doll; the hand cannot grasp with a healthy grip. A minute degree of facial paralysis will sometimes disturb the wonted expression of the countenance, without even friends knowing the cause. A very slight elevation of one eyebrow, a drawing aside of the mouth a hair's-breadth, will materially alter the look of a person; and paralysis of this kind often exists without any one suspecting that softening of the brain is impending. This partial paralysis, which is indicative of approaching apoplexy, very often shows itself in a person's speech. When we remember the number of muscles which must co-ordinate to enable a man to articulate, it will be readily

understood that any loss of power in these delicate muscles must show itself in the speech. It often happens that the first sign will be a clipping of the Queen's English; the person will speak as though he were drunk; indeed, drunkenness does produce the very temporary paralysis we allude to.

A still more singular sign of softening, and the apoplexy which results, is the odd way in which persons in this condition will transpose their words. Dr. Beddoes mentions the case of a gentleman who, previous to an attack of brain disease, used to commit laughable blunders of this kind: for instance, he would say, "Everybody feels very languid this *wet* weather—I mean this *hot* weather;" or, "Come, who will sit down to supper? Here is cold meat and *pudding*—I mean *pie*." Undiscovered and partial paralysis is the cause sometimes of odd mistakes. Thus, a gentleman angrily demanded of his servant, whilst at dinner, why he had brought him a broken wine-glass. The servant, on examining it, affirmed it was a sound one. The master again scolded him; but on [illegible] it himself, found it to be really unbroken. The explanation of this circumstance was that the gentleman had suddenly been seized with paralysis of the nerves of sensation of one side of the lip; consequently, as there was no feeling there within a certain circumscribed space, he naturally concluded, without looking, that a piece of glass had been broken away. In other cases, a person will declare that his finger feels like a sausage. Early warnings, these, that should not be neglected for one moment.

The sight, also, gives warnings that are equally unmistakable to the physician of coming trouble, and more especially the dread symptoms of double vision. Dr. Gregory tells a curious and highly instructive tale of a sportsman, who, when out shooting one day with his gamekeeper, complained of his bringing out so many dogs — asking why he required eight dogs. The servant said there were only four; but his master persisted that there were double that number. Convinced, however, of his mistake, probably by the touch, he immediately became aware of his condition, mounted his horse, and rode home; and had not long been there, before he was attacked with apoplexy, and died. Had this gentleman been treated on the field, when the warning was first given, in all probability he would have been saved.

It is not very easy to distinguish softening of the brain from another malady which is equally terrible. We allude to the general paralysis of the insane. Indeed, the latter disease is very often but a result of the other. In some cases, however, it is recognized as a substantive malady. Dr. Winslow says he has seen symptoms of it impending for many years before it has unmistakably shown itself, or at least the altered mental condition of the individual has clearly been seen—read by the light of the subsequent event. "For a long period," he observes, "before any mental disorder is generally suspected, the ideas are noticed to be of an absurd and extravagant character. The patient talks of the amount of money he has made, of the success of his commercial specu-

lations, his grand prospects, extraordinary luck, and of the bright future in store for himself and family. He magnifies the amount of his daily or weekly receipts, whether realized in the practice of his profession, in trade, or commerce. I have known this tendency simply to distort facts and look extravagantly at the bright side of things through an intensely magnified and highly coloured, because morbid, medium (when the actual circumstances of the party did not in the slightest degree justify such sanguine ideas), to exist for five or even ten years before the mind presented any decided and recognized symptoms of alienation."

As the paralysis slowly commences, the sufferer will be observed to speak with a slow and measured intonation, as if he selected his phrases with the utmost care. Sometimes, indeed, the lips open and shut as if trying to speak without the ability to do so; assuming the action of the lips in smoking a pipe. Hence the French designate it *le malade fume la pipe.* The aspect of the face also becomes changed, the mouth opens and shuts in one piece, as Dr. Skae observes, without any play of the lips indicative of the sentiments or passions. From this point the whole powers of the man, physical and mental, seem gradually to fade away—every power of life is, by the gentlest possible gradation, lost; even those reflex actions which preside, as it were, over so many functions of the body, die; and it often happens that a patient is suddenly choked by the passage of food down the windpipe instead of the gullet—the epiglottis, that sensitive lid which, in a state of health, so

jealously closes and guards the air passage, being paralyzed, and standing open, as if it were to invite the dissolution of the body, thus reduced to a living death.

The injurious effects of blows upon the head are not sufficiently considered, for the reason that in many cases they do not show themselves for years. Where any serious concussions of this kind have taken place, the individual receiving them should always beware of the first signs of distress in the brain. Numberless cases are on record in which a fatal termination has ensued from a blow on the head received years previously. A sailor fell from the mainyard of a ship upon deck, and was removed below in a state of unconsciousness. He speedily recovered his senses, however, and in a fortnight resumed his work. No bad symptoms occurred for four years, after which he was occasionally attacked with headache, and twenty-six years afterwards he became paralytic, in which state he continued for eight weeks, when he died, and on examination it was discovered that a large abscess existed in his brain. In another case, a boy received a violent blow on the head from a cricket-bat, from which he did not suffer any inconvenience for ten or eleven years, when he became liable to attacks of headache of a severe nature; epileptic seizures followed, and he ultimately died, when an encysted abscess, of the size of an egg, was found in the cerebrum. Whilst afterclaps of this kind may always be looked for when any serious injury to the head has arisen from blows or other causes, it does not always

follow that the presence of abscess, even in the substance of the brain, is accompanied by any serious symptoms. Dr. Wollaston, who lived to a good age, did his philosophical brain-work with a tumour in his cerebrum which must, from its size and nature, have existed there many years before his death; and the most serious injuries to the convolutions of the brain have been received without causing much mental disturbance to the individual. These are, however, rare cases, much cherished in the records of brain disease rather as curiosities than as tending to serve any practical scientific purpose; and, as a general rule, it must be considered that no lesion of the cerebrum can take place without its showing itself outwardly in the most unmistakable manner.

If there is any terror in the pictures we have painted, let it not be supposed that our object has been gratuitously to conjure up revolting images for the mere sake of playing upon the feelings of the reader. If the first beginnings of brain disease were generally known and acted upon, the examples we have quoted of the deplorable condition to which human life is sometimes reduced by its unchecked progress, would be greatly diminished.

The slightest settlement in a wall is watched day by day by the architect with the greatest anxiety and solicitude, and every precaution is taken to strengthen the weak place, and to relieve it of all unnecessary weight; and many a stately building has thus been preserved for ages, through the timely substitution of a few sound for unsound stones. Oh! that we

watched with half the care the delicate human brain,—source of mental thought,—as we do this senseless wall,—that we took note of the faint rents and sinkings of the organ of the mind with as much anxiety as we watch perishable stone; many a noble understanding would then be preserved to us that otherwise becomes torn and shattered, hopelessly beyond the restorative powers of man.

*

POEMS.

A GARDEN SCENE.

How the great sun is shining on the slope
Of strawberry-roots! Ah! there's my pet,
Running her white hands under the cool leaves,
Diving for the red fruit tassels. I'd have
Some painter now to catch her eager look,
Arch brows and lips out-blushed by berry juice;
And just that glint of gold athwart her brow,
Let through the rent in her broad summer hat,
That droops as languid as a poppy-flower
On her sunned shoulders. 'Twould be a sketch
To hang in my Sir Joshua gallery.
A single word would bring her running up,
Her finger-tips like honeysuckle buds
Five-parted, deeply dyed with odorous stains
And holding some seed-speckled shining prize
Plucked with its brother-blossom. I'll take
The shady holme-walk leading to the root-house.
Old Joseph sees me coming down the path,
And wipes his forehead with a serious look.
I'll warrant, now, he's got some curious graft

Or monster flower to show. I hate such tricks
On Nature (plague take the parchment names
The pruning knave gives to God's simple flowers).
And yet there's something in the earthy man
That poses one; his shoes look just like roots.
I've watched him in the hothouse, muttering
To the long, hairy creeping plant, hung up
By four thin threads to the great branching vine;
And slow I've seen him dodge the bluebottles
With thick, unwieldy fingers 'cross the panes;
Then stealthily go feed the Venus fly-trap,
And as the delicate green leaves curled round
The glistening villains, how the clod would grin!
And then, he grows such rare prize orchises,
Close-winged papilions, and hum-ceased bees
So delicately poised, they'd cheat a boy
With ready cap—he'll win the medal yet.
The broad sunflowers at the high noon stare,
Their comb-stored discs alive with busy drones;
Wide open stand the bell-mouthed cactus-plants—
Like thirsty tongues their golden pistils loll
Over the flaring scarlet; flashing spar,
Piled rockwise round the pond, burns up
The fine streaked feather-grass. Such noons
I love my great north drawing-room sketched round
With sheathéd water-lilies, and children white knee'd
Striving 'gainst soft streams with minnow-nets;
And as the gauzy curtains swell,
To watch the black and yellow belted bees
Towards the south peach wall, with dreamy sound
Sail slowly by.

WESTMINSTER CLOISTERS.

The thirteenth day of June—'twas hot enough
For one of those old summer noons, before
They meddled with the calendar, and nipped
Us of a fortnight's comfortable sun—

Thanks give I to the monks, with all my soul,
For their cool cloister roof, and lay me down
Full length along the mouldering Gothic bench,
Envying almost that ancient abbot stern,
Gervatias de Blois, who close beneath
Lies cut in stone. What might one better do
On sultry days, than lie upon one's back,
Along a cold stone flag, clothed all in stone,
In full straight folds down to one's very feet;
Whilst pendant gossamers, from bosses hung,
Rising and falling with slow stately swing,
Wave one asleep; or, as the eve came on,
Marking the bats across the cloister grass
Hurl themselves edgeways with delicious rush:
Such were cool dreaming, for the weather fit.

That old De Blois, he was a priest, indeed,
Clutching his crosier on his carvéd grave
As though he'd rule them from his very tomb.
The monks who stole here from refectory
To cool an after-dinner's bursting paunch,
Crept curve-wise round some yard or two, in awe
Of the old Norman's irritable bones;
Though, for the love they bore him, had they dared,
His very name and date they would have scuffled out.

Abbot and priest, they've time enough, at last,
In purgatorial graves to clear themselves.
Each slab we step on's answered from below,
By the fat marrow of some ancient monk,
Who yet grins up in hate through brass and stone,
As overhead some evangelic dean
Trips past in haste, to fill with serious look
The chair at "Pastoral Aid" Society.
Pastoral aid, indeed! listen beneath,
And hear them crunch their metacarpal bones,
As they would fix him there in grisly clutch,
His weasand clipping with their rosaries,
To stop his scheming 'gainst the Church's good.
But, hark! the diapason's throbbing bass
Trembles through windows pictured with the saints.
——Now, by the sweat of tempted Anthony,
Were I the veriest mummy of a priest,
The sacred wafer in my gorge would rise,
To listen to these hated heretics!
'Tis Tallis day, and nimble-fingered Turle
Is torturing with stern Lutherian hymn
The rare organ's fine old Catholic breath.

BE TRUSTFUL.

It was the morning early,
The sun shone on the grass,
The dew-drops, pure and pearly,
Hung like fair beads of glass.

A little child lay playing
  Upon the smooth-shaved lawn;
Seemed it the sun was saying—
  "Oh, youth, enjoy thy dawn."

Then moved a shadow slowly,
  A shade new born with day,
Until it wrapt him wholly,
  The while in thoughtless play.

"'Tis thus," said I, repining,
  "Weak child and strongest man
When at their gladdest shining
  Pass under Sorrow's ban."

Within the heart of laughter
  A secret fear is bred,
And the darkness of hereafter
  From present joy is shed.

Amidst these musings gloomy,
  Despairing thus of life,
Calm, hopeful thoughts came to me;
  Faith conquered in the strife.

With countless frank-eyed daisies
  The shadow seemed thick laid,
Like little children's faces
  The world's not made afraid.

They had not much of beauty,
  But constant looks of praise,
And a calm and fixéd duty
  Shone through their steadfast gaze.

So, God, my heart to freshen
And free me from my care,
Had taught me a great lesson
By little daisies fair.

Again 'twas sunny morning,
And sweet as sweet could be,
The birds, the dull earth scorning,
Sung from each branching tree.

AUTUMN ON THE HILL SIDE.

Upon the upland, slanting to the plain
(Gently as slants a bird with outstretched wings),
Dreaming, with half-closed lids, I listless lie.
The thistle-downs float slowly past; each seed,
Pendulous swaying from its parachute,
Skims lightly o'er the hindering blades of grass:
The purple heath-bells, swayed by gentle gusts,
Knock, timidly against my brow and cheek:
Whilst ever, in the amber fields below,
The flashing sickle, by brown Labour urged,
Gleams crescent-wise through falling threads of corn.
Far off, along the tranquil landscape, creeps
The smoke's thin azure from the stubble fires.

All 's gentle motion and continual calm.
Oh, that the scene's content we could drink in!
With thirsty eyes and realizing brow
I gaze, and it is gone; just like some star,

That, in perusing, fades—to dreamy eyes.
The vividness returns. Westward I look.
The setting sun upon the hill's brim rests,
Shooting a golden weft along the ground.
In life-lines o'er the bosom of the steep
The sheep-tracks run, and ever from the sheep
Long shadows stream. Over the broken wall,
With bended knees, a ram leaps suddenly
And stares, tinkling at intervals the bell
Half muffled 'neath his woolly throat; full browed
Between his rib-carved horns, firmly he stands;
And round him gather up the scattered flock,
Till like a cloud the whole drive swiftly past,
Seized with a panic fear. Upon the hills
And o'er the plain, still crowned, Summer sits;
But in the vale sad Autumn slowly steals.
How melancholy, in my homeward walk,
Between the avenue of limes, to see
The leaves fall undulating one by one,
And then upon the ground in eddies whirl!
There are no bees about, no busy drones
Curious within the painted chalices.

The sun-dial in the garden day by day
More idle seems. The pathway weedy grows;
And we do watch no more a favourite flower,
C[illegible] the buds.

A WATER SKETCH.

Thorold. Here, love, towards this islet let us steer,
Flush in this bay, thick paved with lily leaves,
The clear white cups our keen keel swirling down;
And, see! up the dumb water-beetles dart,
Then dive again among the swaying stems
Our boat glides over. Hark! how fresh the sound,
As 'twixt the reeds we crash upon the bank:
Firm footing here this tuft of rushes gives;
One step, and those twin-daisied feet we land
Upon the swarded green. See, darling! here,
Among the weeds, the glist'ning pieces still,
Of the Venetian glass I broke last spring,
Toasting "The lady with the Greek-waved hair,"
Till the last bubble burst upon my lip.
Here I remember on the ground I lay,
Noting the silver satin's changeful flush,
And the long feathers nodding courtesies,
Beneath that murm'ring shade of sycamores,
Where now the cloud of insects rise and fall;
Then came a laugh, and then—your deep blue eyes
And yellow hair, of leafy shade grown tired,
Towards yon tree, came out into the sun;
Down dropped the ruffles from your loving arm
Upstrained to switch the chestnut's budding cones,
Which scattered all around their little stars.
"I wish I had the giraffe's neck," you said,
"To snap that tantalizing upper bud!"

And then turned round, as if a friend were nigh,
To where I stood admiring. That curtsey proud!
Look, love, and see, from out the rustling reeds
The swan sail past. No Roman galley-beak
Back-curved disdained the water so—'twas thus
You drew up seeing me: 'twas all rare art—
Confess how much?

Millicent. See my poor finger now,
How you have bruised it with my opal ring!
Well, then, what cared I for the chestnut buds?
They said Sir Owlet there was quizzing them,
And so I volunteered unearthing you,
Hid close among the waving screen of ferns;
'Tis still continual mirth—how suddenly
I froze that pert assured smile of yours.
I've often thought I should have lost you then,
Had not that glorious Lanner's Waltz struck up,
And swiftly into Pity's melting drops
All my hoar-frosted haughty pride dissolved.
Then your revenge!—Up sprang the [illegible]
strings,
Beneath the harper's spirit-stirring hand;
And round you whirl'd me till my hair blew back
And pants broke up my set-rehearsed speech:
I've scarce forgiven you for so cheating me
Into acquaintanceship.

Thorold. Loop back your shawl,
Let thus your bonnet from the ribbons swing,
Just as, the music ceased, you wandered with me
Through the woods. I'd picture o'er again

That scene—remember how polite we were,
Growing botanical o'er every flower;
Then the blue sky, its deep intense admiring,
And the grey shadows on the rounded clouds,
Afraid to say what most we had at heart.
Then the beech wood came—the tall wood of masts
Branchless and still; what wonder sweet, my love,
That here we let our golden secret out?
The rest you know.—I've felt so happy now,
Watching the sun-waves' ceaseless flickering
Upon the boat-side dance, just as old joys
Come gently rippling 'gainst the saddened heart,
And break in glowing lines.—I've scarce perceived
The tide has left these flags; we've barely time
To clear the shallows in the upper reach,
And bring our skiff up to her mooring-ring
By the old willow shadowing the creek.

THE TWO PICTURES.

One winter's evening, just as light had fled,
And noiseless glowed the keen bright frosty fire,
Mary and I, close drawn up side by side,
With eyes dilated, on the caves of gold
And shining castles in the embers clear,
Sat musing on the features of the Past.
And Retrospection many times arose,
Soft as a diver rising through the sea,
And showed old sorrows that, like softest pearls,

'Mid tangled fragments of forgotten things,
His hand had rescued from deep Lethe's stream.
And in the midst of those old faded scenes
The wicker of the little cot it creaked,
Rousing the quick-eared mother from her dreams.
You should have seen her with fresh parted lip
And hushing finger, though the sound was past,
Hanging upon the gentle breath of sleep,
The perfect picture of maternal care.
And then (so runs the music of the heart
That one sweet note remembers yet another)
Once more to me she turned, and with white hand
The silken curtain of her hair drew back,
And fondly pressed her loving cheek to mine,
As though she'd coin her heart out at a touch.

Thus as we sat, my fancies found them words,
And Mary listened, with her hand in mine,
The whilst I visions of the future drew.
I told her of the early morns of June
(Ere yet the starlings underneath the eaves
Lifted their joyous songs, or swiftly ran
With dewy breasts upon the meadow grass)—
When little voices, freshly waked from sleep,
From distant rooms, and laundries, full of sound,
Like to the charming of young birds, would come.
I drew a picture of an eager group
Clustered in quiet by the evening fire;
Their breathless faces fast upon me fixed,
As little leaves enforcéd by the sun,
The whilst I told them of the bloody key,

And fearful Blue Beard calling up the tower
To Fatima, who, in her utmost need,
Saw no help coming but the flock of sheep.
I showed her all their faces flushed with joy—
Their clapping hands when giants dire were slain,
And the deep wonder dwelling in their eyes
At the unfolding of bright fairy tales,
These marvels that invisibly seem writ
Within our hearts, till little children come,
And warm their hidden characters to life.

And then in fancy up the toilsome stairs
My wife I took, and, through the half-open door,
Showed her our little children on their knees,
Palm unto palm their placid hands upraised,
And prayer escaping from their parted lips
Gently as odorous exhalations creep
From out the bosom of an opening rose.
And further pictures then I should have drawn
Of gallant boyhood, generous and free,
But that my Mary pressed my arm, and said,
"One moment, love—a little let me dwell
Upon this joy: your words within my soul
Have set a golden ladder up, whose end
Is lost in shining clouds of happy light,
On which my thoughts, like angels in the dream,
Climb with a glory burning on their wings.
Ah, me! I fear this heaven is too glad,
And that swift shadows bar the happy light."

Thus as she spoke, there rose within my heart
A picture full of sorrowful regrets.

"I see," said I, "the shadow that you dread,
As 'mid the dim green underlight of leaves
A desolate nest among the branches stands,
Emptied of brooding love and cheerful song;
So stands our household in my second dream.
No more from out the sunny garden comes
The shout of boyhood swinging on the branch;
Fled are our little birds, and we, dear wife,
Old joyless people, in the vale of years,
To the dim memories of our children gone,
Are left alone within the dreary house.
Canst thou not see us wandering through the rooms,
Each one the prompter of some perished hope?
Here died our fairest girl, and 'mid our tears
Bade that we kept it evermore the same;
Bade us be careful of her little birds,
Her plants, her range of poets on the shelf;
She loved them so, be sure she'd come again
To haunt once more the old familiar place.
The room remains through twenty years the same,
Still in her careful drawers her long white frocks,
With lavender all scentless now with age,
Lie stored, and tell of summers long ago.
Or, 'tis the sad mute playroom that we tread,
The echoes of old sounds within our ears;
Old toys they lay about to touch our hearts
With the sad dew of tears, that never more
They shall be cause of joyous mirth again.
Along the floor with silent foot of gold
Steals the warm sunlight, freshly as the day
It glittered on our darling's flaxen hair.

Our eldest boy, noisy with drum and fife,
Saying he'd be a soldier when a man;
Ah, me! we dreamt not then the end—
It was God's will it should be as it is.
There hangs upon the wall his silken sash,
Faded beneath a burning Indian sun.
Poor boy! he bravely died; we had his captain's word
For the young ensign's honour in the field.
Poor boy, he was our last——"

Upon my hands
Hot tears, large as the drops of summer, fell,
Stopping my speech. Alas! these were but dreams
That I wove sitting by a winter's fire,
Which faded in a moment from my brain;
But in her woman's heart long time they dwelt,
And the bright angels that before did climb,
One after one, with shadows on their wings,
Slowly she saw descend.

MY ROOM IN THE COUNTRY.

With aspect bright, my little room
Should ever be exempt from gloom;
In straight white shafts the morning sun
From the east should inward run;
And the last faint streak of day
Through the western pane should stray.
And cooling chintz of fashion old,
Retaining still its careful fold,

Should cover all the spacious chairs,
And seem to speak of housewife cares.
So dumb the carpet should be wrought,
No sounds of footsteps might be caught,
Much less sly Nan's, whose sweet surprise
Should be to creep with laughing eyes
On fearful tiptoe up behind,
With little hands to make me blind!

Of pictures round I shall have few,
But all of Nature speaking true.
A Constable, so lucid sweet,
On sultry days my eyes to greet;
As boys who splash beside a brook,
So dewy cool should be its look.
And Danby, chiefest of his band,
Within the compass of my hand
Should picture me a desert vast,
A toiling caravan o'ercast,
And foundered 'mid the burning sand.
And on the wall toward the east
I would have an endless feast,
A landscape of that rare old Cuyp,
Of breathing full, and sun-warmth ripe;
And when the great orb downward rolled,
Along the wall the squares of gold
Athwart its face should slowly melt,
Whilst Nature art, Art nature felt.

Not all alone I'd keep apart
This room from her who shared my heart,

And as affection ever masks
The sacredness of pure love tasks,
My own dear girl should often find
Excuses perfect to her mind:
"Her fuchsia, lacking water, drooped;"
Or, "The long curtains were unlooped."
And on such small pretexts as these,
She should be my fondest tease;
Disturbing me rom deepest books
By constant hindrance of sweet looks.

One window should be trellissed deep
With jasmine stems, and you should peep
An arm's depth through the sheltering green;
And there should struggle up between
A rose-tree, and its blooms above,
Heavy as woman's heart with love,
Should, when the fitful winds bode rain,
Throb gently 'gainst the casement pane.
The lattice I'd have open wide
(The hindering stems just pushed aside)
Upon the cool deep grass of June,
'Thwart which there should be swathes beat down,
Such as we trench with feet all white
From dusty roads with pure delight,
Just issuing from a city hived,
With pure delight, and heart revived
That we have lived once more to feel
God's breath about the country steal.
And when an idle fit came on,
I'd ope the window, and the song

Of birds in high-up branches clear
Let in upon my charméd ear.
And as I lay at length, the breeze,
From base to spire, the poplar-trees
Should ever stir with slumbrous song,
Whilst quivered all their leafy throng.
And, like a fall of summer snow,
The apple-blooms should softly flow,
'Till every nook within the room
Was filled with drifts of fresh perfume.
Then musing, half awake, I'd lie,
And, as I gazed, a bird should fly
Swiftly across the window pane,
And then a full shrill note should strain
Right in my ear. And as I mused,
Both sight and sound should grow confused;
But still, within my inmost brain,
That bird's song should bring back again,
With one sad touch of sense refined,
Some old forgotten state of mind.

ASSOCIATIONS OF A SHELL.

Can I forget that calm long evening
When last we walked together by the sea?
Can I forget? Ah, no! Each image clear
Remains of that glad season in my soul,
As did our footsteps then upon the sand.
It was the flooding of the great spring tide,

And she would have me to the headland stroll,
To watch the white spray showering o'er the rock.
It was a glorious sight, as we passed on:
The sweeping bay with golden sands lay rimmed,
On which the proud imperious sea advanced,
With heavy murmurs each translucent scroll.
Now can I picture, as 'twere yesterday,
How fair she stood, as through her summer dress
Faintly the breeze her slender figure sketched.
Her curls (almost too heavy for the wind)
Beneath her chin she held with one white hand,
Laughing so merrily with half-closed eyes
When the gusts thickened. Then as I said
(What I had said a thousand happy times),
"Dear Letty," whilst her willing hand clasped mine,
A clear-necked wave impetuous on the strand,
Urged with a singing sound its thin smooth flood,
Glassy the sand on its retreating shone,
And there, neglected by the tide's reclaim,
A curious shell upon its spines stood poised.
I was the servant of her eager eyes,
And ere the foam-bells from the sea-gift died,
The prize was hers. 'Twas the last evening,
Ere she sailed from us in that fatal boat—
How long that time ago! All the old haunts—
The shallow pools, for the fine sea-weed famed—
The limpet rocks, where first her gentle hands
She bade me help to pluck the stubborn cones,
And the tall fishing stakes—long gone are they,
Deep mergéd in the overwhelming sea.
This little shell alone to me remains

Of all that vivid scene of long past years;
There lies it on the polished mantel-piece,
Its pink lip turning to the marble chill,
An image of that miserable noon,
When passionate my lips to hers death-cold
I pressed, and the awed fisherman knelt by,
His rude hands (corded as his own strong net)
The sea-weeds plucking from her drownéd locks.

. . . . . .

How my life centres in that cheerless day,
And how this little shell brings back again
That clear bright picture and its heavy shade!

THE ANCIENT GARDEN.

About the middle of a summer's day
Once was I wandering in the silent paths
That lay within an ancient garden's gloom;
Stirring the night-moths underneath the leaves
Of the fresh privet hedges, white with bloom,
So on, adown the solemn yew-tree walk,
That cast a shadow like a solid wall,
Until I reached that gloomy garden's heart,
A little space, that, free to sun and air,
Lay damasked with the painted spires of flowers.
Fast in the centre stood an ancient dial,
That seemed the solemn spirit of the place,
Severe in silence, mid the flood of light.

I leaned my elbow on the crumbling stone,
Painted with lichen and green canker stains;
And whilst I rested for a season brief,
My spirit fell into a quiet muse;
And soon I peopled all the space around
Quaintly in fashions of a day gone by—
The footsteps heard of all that trod those paths,
The old, who tottered in the burning sun—
The lovers, hand in hand, who sought the shade,
In the fresh mornings counted with the Past.
All these, thought I, within this little space
Stood here awhile, and marked with different mood
How the black shadow of the tooth of Time
Devoured the shining circle of the dial.

First came the old man, trembling on his stick;
A moment gazed—then shook his withered hand—
Alas! my time is very short, said he;
And, feeding on the faded picture of his youth,
He passed. Next, came young manhood flushed,
What of the clock it was, at leisure read,
The whilst into the Future fast he pushed.
And then a maid with yellow hair blown back
(Like tearful angel in some missal old),
Who read of broken trysts in ages past,
A moment glanced to see how late the day,
And still no footstep down the pathway came.

Where are they gone—the old and withered man,
And the first fresh glorious dew of youth?
A passing bell—the fall of bitter tears,

And now upon the hill-side's gentle slope
The sheep are wandering o'er forgotten graves
And so the people of the garden passed.

Not so the garden. With each gladdening spring,
The old roots stir within its ancient breast.
The hollyhock shoots spirewise through the air
And hangs her crimson bells out to the bee.
The rose unfoldeth to her inmost leaf,
The vine creeps on. The cedar's tardy growth
Has jostled out the mossy, crumbling seat,
Where once the lovers idled in the shade.
Perfect the picture—as it was of old,
Save human hearts which have for ever passed.

Thus musing, down a shady walk I turned.
This life, said I, slips very fast away;
But who would stop the running of the sand?
'Twere but the folly of a child, who grasps
The waters of some swiftly running stream,
Which mocking through each vacant finger flows
Down to the great inevitable Sea.

THE PASSING OF THE STORM.

Slowly had sailed away the heavy rack
That hung between us and the god of day;
And there remained but one lone cloud and black,
That noiseless moved against the sunny way

And as it passed, beneath its under-edge,
The Sun sent down his smile upon the earth;
Spreading from field to field, from tree to sedge,
As laughter spreads around a tale of mirth.

The sunshine now with joyous step moved on
Until it reached a corn-field, spreading wide,
That, pale before the wind, ran swift along,
All blanched with fear, like foam-waves on a tide.

But every ear soon felt the sunlight fall,
And quick upreared its head against the sky,
And shook its yellow beard and form so tall,
As cowards do when danger has gone by.

Released, the glorious orbéd sun did rise,
And Earth smiled gladly through her crystal tears,
Glad as the looks that gleam from brimming eyes
When joy doth take the place of haunting fears.

And then the splendours of the arch did grow,
The moist earth spanning with its glorious sweep;
A frame of coloured tears its gentle bow,
For many a village spire and rural peep.

Slowly away I saw that lone cloud ride,
Its sluggard shadow loitering o'er the plain;
But swift anon it climbed the mountain side,
Contorted strange, like some huge thing in pain

THE DESERTED COTTAGE.

RANK nettles grew sidling the barren walls,
  Grass peeped atween the pathway stones,
Green thistles and long ivy falls
  At night made sighs and moans.

Yet were there lingering remnants there,
  Between the tangling of the weeds,
Of plats, and such trim gardening care,
  That still showed faintly through the reeds

High up the second lattice frame,
  Showed all a hollowness behind;
No light was there, no cheerful flame,
  No shadow moving thwart the blind.

This mouldering lattice-sill upon,
  A large dog-daisy breezes wooed;
And by it when the eve came on,
  A lizard crept to seek for food.

The noontide ever found all peace,
  No latch did clink, or creaked the floor
No motion for a lengthened lease
  The spider had across the door.

LIFE AFTER DEATH.

With dancing plumes they brought me up here dead:
Dead, and to lie until the end of time.
They cursed me ere the priest had shut his book,
And cast a stone down for the clod of earth;
And here they left me on this hill-side bleak,
Face unto face with my offended God.

Day after day, until the end of time,
Here must I lie within my narrow bed,
And ever gazing upwards must I read
The sneering lies they've graven on my tomb,
Touching the merits of the rich deceased;
Whilst texts of Scripture, circled round with clouds,
And gilded angels at the corners set,
Mask with a smile my dark and utter woe.

Welcome to me each little sound that breaks
The hideous vigil that I'm forced to keep—
The sheep's short bite upon a neighbouring grave—
The stranger's tread in summer evenings calm,
Wandering from stone to stone with pace subdued
Of epitaphs and ancient dates in search—
And, more than all, the Sabbath's simple bell,
My only measure for the passing time.
Quickly my darkened ear doth catch each sound,
The old rope fraying 'gainst the belfry beam;
The pathway swarming with quick children's feet,
As files along the punctual village school;

From every side, the people as they pour,
Some from across the scented fields of bean,
Some through the breast-deep, poppied, waving corn,
The village spire a central point to all.

A hundred knees soon meekly bend them down,
So still in prayer the little bee's clear hum
Entering the porch fills all the listening aisle
(For none might hear the angel's rustling wing
Who at God's altar ever humbly tends).
O Christ! for one short hour of living breath,
One little hour, the meanest listener there,
The meanest hind who at my 'scutcheon stares
With awe and wonder at its bloody hand,
That palm to palm thy pardon I might crave
To lift away my heavy load of sin!

The preacher's voice into my prison sinks,—
"As falls the tree so ever must it lie."
My prayers they stop, my supplicating hands
Dismayed fall down beneath the damned dead.

Too late! too late! religion's tender dew
Falls but to mock upon my house of clay;
Fool that I was, the faintest word of trust,—
Late as the dying thief upon the cross,
Tremblingly breathed into his Saviour's ear,—
Pure as the morn had sent my soul to God.

The smiling people pass out through the porch,
And thread the green graves to their happy homes;

The meagre sexton shuffles down the path,
The hatchway shuts, and all's again at rest
Within the circle of the churchyard wall,
Death's dismal pound, upon the lonely hill.
Here must I lie until the end of time,
A faithless servant trembling at the door,
Who waits in fear his angry master's call,
And the inevitable doom to come!

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