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Poison and Adulteration.

Happily for us, the day has gone by when human life was of so little value that poisoners were to be found in all classes or ranks of society, and their deeds of villany were done in the open day without the smallest fear of detection. In the olden time, if one person wished another out of the way, all he had to do was to signify his wish to some one of the numerous learned villains, who would do it for a consideration. Chairs, clothing, food, beverages, all were capable of being poisoned, and persons knowing of no other means used to wear amulets and charms to protect them from the effects of the poisoner's art. This refined method of murder had become a study, and was practiced as an art, as we know from the notorious examples of Brinvilliers and Borgia. We say, happily these days have passed away, for the light of pure and glorious science has broken in upon us, and now, as sure as the most subtle poison is administered, either by the microscopist's minute vision or the chemist's magic test, will that same poison again be brought to light, and made to confront the poisoner face to face. As a natural consequence, direct and intentional poisoning has diminished, but indirect and unintentional poisoning has increased, and all from the want of a little more knowledge generally diffused. Take an example: not long ago in Scotland, a party sat down to dinner and ate some horse-radish, as they thought, and all died in the greatest agony, for they had eaten aconite, a most deadly poison, instead. Now these two plants are much alike, and surely we ought to learn their distinctive features, that we may know for ourselves, and not trust our lives to an ignorant cook.

There are so many substances nearly alike—the one a deadly poison, the other perfectly harmless, or perhaps beneficial—that we hope in time to see some means adopted in every city whereby all these bodies may be placed in such a manner that all their individual peculiarities shall be pointed out. Thus now-a-days, from want of knowledge comes unintentional poisoning, but from an evil application of knowledge comes indirect poisoning, and this is carried on through every branch of trade, under the name of adulteration. The London *Lancet* first directed the attention of the public to this subject, by publishing analyses of various articles of consumption bought promiscuously in small and large quantities. The examiner-in-chief was Dr. Hassall, who has since published a very valuable work on this subject, and from its pages we learn that almost every article that we eat, drink, or inhale, is more or less adulterated. Thus coffee is mixed with chicory; tea with sloe and tea leaves which have been previously used; bread with alum, potatoes, and all sorts of things; and cayenne pepper with red lead. Pickles are made green by sulphate of copper (verdigris); red lead and tumeric are common in preserved meats, tobacco and segars are made up of cabbage leaves, apple parings, and all kinds of rubbish; but what is worse than all is that many medicines are also mixed with articles perfectly contrary to them in effect, although perhaps having some resemblance in outward appearance. If a physician writes a prescription, and that, being made up by a druggist of adulterated drugs, does not act as the medical man expects, but injures the patient, is not the druggist or adulterator to be held responsible? In England this question has excited so much attention that there is an agitation on foot to appoint local inspectors of articles of commerce, who shall have the power of indicting any one who sells an impure for a pure article, and thus sending out not only an acted lie, but also great injury to the public health. We may be asked, how does this question affect us? We are not in England. Our storekeepers may be honest, while their's

are not. There is no doubt they may be honest; but we must recollect that it is not mere dishonesty that induces adulteration, but that principle of trade which prevails equally on both sides of the Atlantic, namely, competition—the desire to obtain custom by underselling, and the folly of the public in patronizing the low-priced stores simply because they are low-priced.

We hope to see the people of this country arousing themselves to this inquiry, and making up their minds not to take poison in any shape or form whatever.

The Iron Age.

Poets have given to each age of this world's history a typical metal, one which has characterized and typified the leading features of civilization at the time, and which, so to speak, by its own physical properties and uses, has reflected the manners, customs and habits of the people then living. Following the idea of the poets, we call this the Iron Age; for if any period deserved such a name, it is that portion of time which we call "to-day!" Iron is our strength and stay; without it, the onward march of civilization must stop, and the word "Progress" be cancelled from our language. By a providential arrangement Iron is universal in its occurrence in nature, and by human ingenuity and talent it is universal in its application. Let us look, first, at its universal occurrence, and think how vast must be the quantity in the world. It is found in all the rocks that form the crust of our globe, in greater or less quantity, as may be seen from the prevalence of red and reddish brown in their colors; in all animals, for it is Iron that colors the blood; in all fishes, for it exists in the waters of the sea. Go where you will, and turn in any direction you may, Iron meets you at every step. There is, however, another consideration, and that is that we seldom find it in a metallic state, but usually combined with some other element, and this is providential also, for it stands as a kind of mighty tempter, persuading and urging man to exercise his talents, and to exert his genius, so that that dirty-looking lump of red earth called Iron ore may, by the workings of a man's talents, ingenuity and genius, become the steel pen with which we write; and we say with truth that no one substance on the face of the earth has done so much in the development of man's latent powers, in rendering our lives comfortable and luxurious, and in advancing harmonious feelings, and free intercourse among the nations of the world, as Iron.

Let us now turn to the universality of its applications. We cannot turn our eyes or thoughts in any direction without finding some purpose of use or ornament to which this metal has been successfully applied, and its peculiar characteristics render it peculiarly adapted to fill the wants of man. It is easily melted, so that we can run it into molds of whatever device or pattern we wish; and when cold it is so strong and firm that it seems to be a work of nature rather than one of art. It is easily welded, and by this process can be readily joined in any part that is fractured, or it can be bent while hot to any curve or shape. It is tough, and will resist the strongest crushing strain; is not easily acted upon by the atmosphere; so it is just suited for the position we have given it in this nineteenth century, in which, amongst our necessities and luxuries, our real and imaginary wants, it holds the place of the King of Metals.

The Gyroscope Paradox.

On page 200, Vol. 11, SCIENTIFIC AMERICAN, we published, for the first time in this country, an engraving of the above curious toy. Since that time it has been discussed by all classes and shades of thinkers, and as a natural result, all sorts of theories and explanations of it have appeared. Considerable flourish has been given by some of our cotemporaries to a theory of Mr. McCarroll, of Canada, as probably the correct one. He shows that the ring and wheel remain sus-

pended so singularly on one side of the upright, from the fact that the resistance of the centrifugal force of the wheel to any alteration in the plane of its motion is greater than the force exerted by gravity towards making it alter that plane. And as to the ring revolving round the point of the upright, in a direction contrary to that of the rotation of the wheel, he asserts that a wheel in motion does not impinge on the same point of the axis that it rests on when in a state of repose.

"For instance," he observes, "when a vertical wheel is set in motion, one-half of the body is acting in opposition to the laws of gravity, and the other half, so to speak, in the line of gravitation—hence the unequal discharge of forces on the axis. On one we have gravity minus velocity. In so far, then, as the end on the axis is to be considered, the point of the heaviest impingement will be found on the plus side of the wheel. This being the case, the ring, which is free to obey any impulse given in its own plane, must necessarily retire before an excess of force exerted on the plus side of the axis of the wheel."

The centrifugal force theory is not new, and Mr. McCarroll is not entitled to the credit of suggesting it; as to the revolving ring, the explanation wants proof, as there is no law in nature which will enable us to say that "the ring which is free to obey any impulse given in its own plane must necessarily retire before an excess of force exerted on the plus side of the axis of the wheel."

The American Institute Fair.

On Tuesday, the 15th, the twenty-ninth Annual Fair of the above well known institute was opened at the Crystal Palace. Although the day was fine, the visitors in the morning did not seem to be very numerous, but in the evening there was a tolerably large assemblage collected to hear the opening address by the Hon. Mr. Meigs, whose annual appearance in this character is as steady as the motion of the planets. It was a plain, but common-sense review of the progress of industrial science during the past year. He made many valuable suggestions with reference to agriculture and the mechanic arts, and expatiated on the power of Great Britain to whip half the world with her immense engineering power, etc. After which a panorama of the Rhine was unwound before the admiring eyes of the juveniles, evidently much to their delight. A band (which played lustily during the speech) enlivened the evening with airs—national and general; and so concluded the opening ceremonies. We cannot help remembering the old proverb, that "if a thing is worth doing at all, it is worth doing well," as it applies with great force to the opening ceremonies of the American Institute. Surely a speech—however good—delivered at the end of a long, narrow and inconvenient picture gallery, with music playing and noises being made in all parts of the building, could scarcely be appreciated by the auditory; besides, the oration came off half an hour behind time. We would have it understood that this was no fault of Mr. Meigs, as he was there in time, patiently waiting for the Committee of Management to make their appearance and hear him. When the committee did arrive, (each with a scarlet rosette in his coat to denote his membership,) and gravely sat down, the proceedings commenced and ended with little or no edification to any one. If the Institute intends to continue these official openings, should they not be something worthy a great society, and not the hurried, unsatisfactory things that they are? We would advise them, in future, to discontinue the opening farce altogether.

Now for the Fair itself. From the present appearances we think it will be one of the best that has been had, although at first, from inventors not sending in their objects of exhibition early enough, much space remains to be filled up, which we have no doubt will be speedily done. There is much in the way of machinery, some unpacked and not set up, and some little not yet unpacked; so that, this week, it is impossible to give anything like a

detailed report, as very few departments, if any, were completed at the time of our going to press.

There seems to be about the average number of novelties in all departments, each of which will be noticed in due time. As a sign of the growing importance of this exhibition, we hail with pleasure the presence of a six-cylinder printing press, manufactured by Messrs. Hoe & Co. for a German newspaper, the *N. Y. Staats Zeitung*. These famous presses enjoy the highest repute, not only here, but also in England, where the *Morning Star*, a London daily newspaper, and that mammoth of the press, the *London Times*, are, we believe, shortly to be printed by its aid. When these large manufacturers come in and show the products of their genius and capital, we cannot refrain from thinking that it is a very healthy and prosperous sign.

We observe, also, a new cotton gin, which is intended to gin the cotton in the field and send it out, not in the shape of raw cotton in the bale, but as yarn from the plantation. Should this be worth anything, it must be worth a great deal; but even should it be successful, and cheapen yarn at the South, we doubt not the active inventor would contrive some method whereby he could successfully compete with it. The machine was motionless, and, as no one appeared to offer any explanation of its operation, we are obliged to defer our notice until another time.

We also notice a case of saws and other hardware goods from Messrs. Hoe & Co., at the end of the north transept. It is arranged with taste and elegance, and the goods themselves are of the first quality.

The motive power for the machinery is to be supplied by three boilers, each about three feet in diameter and thirty feet in length, and ought to furnish a sufficient supply of steam for all the purposes of the exhibition. Already, on a pipe provided for the purpose, about a dozen steam and pressure gages are put into use, and more will probably be added. The engines that are to effect the transformation of steam into power are three in number, all with horizontal cylinders. One is complete and in action, and works beautifully, with a motion as steady and true as the upflowing of the tide. It is sixty horse-power, and made by Messrs. J. S. Bunce & Co., of this city. Of the others, one is made by Messrs. Hinckley & Egrey, of Bangor, Me., and is now ready for use. Its cylinder is twelve inches in diameter and three feet stroke. The third (made by Messrs. Corliss & Co., of Providence, R. I.) is not yet put up. These engines will convey the power to the shafting by belting in the usual way.

It is with feelings of pride that we look around on the spectacle presented to us at the Crystal Palace: the merry face of the visitor as he passes up and down; the anxious look of the inventor, as a small crowd gathers around his invention to hear him explain its merits, and his look of joy when they signify their approval of his effort; everywhere, all around, has the genius of man seemingly run riot; and you cannot ask for anything of ordinary use or popular appliance, for which there cannot be found an improvement to supply your want. In times of old, this fairy scene of busy life and useful purpose would have been regarded as the work of fairies and genii; but now, not having these beings at command, we have raised another, which we call the Genius of American Industry, and this we use. It is this that nerves the strong man's arm in labor, that supports the weaker woman in the factory, that cheers and encourages the inventor in his closet, and our sailors on every sea; and greater than all this is the spirit of genius which appears to rule in the opening Fair. We shall gladly chronicle its progress since the gathering and dispersion of its curiosities last year.

Among other novelties, Robinson's Patent Spring Stairs seems to attract general attention, if we may judge from the numbers we have seen running up and down them to try their effect, and they are certainly a very novel application of a spring. On the middle