## Srientifir ghmerican.

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O. D. MONN.<br>A. E. beach.

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## a Cometary retrospect.

From recent calculations of the elements of Coggia, comet by Mr. Plummer, an English astronomer, there ap pears to be a close similarity between them and those of Comet II of 1737. There is a sufficient correspondence, it seems, to warrant the belief that the two comets are identical, and that we are receiving a second visit from the vagrant body which attracted the notice of the astronomers of a hundred and thirty-seven years ago. We find no record of its being a very prominent object, although it appears to have been observed in many of the great cities of Earope. Nor do we find statements of any peculiar phenomena connected with its appearance.
There will doubtless be many who, in gazing at the comet night after night as it gradually augments in brilliancy, will ponder as we have over the vast progress which the world has made since the era of the former visitation.
Locking at the condition of Bcience in 1737, from our present standpoint, it is easier to regard the circumstances neg. atively, to imagine our own condition if deprived of the results of discovery and of progress which have accumulated in the intervening years. The spot, on which the building in which we now are stands, was then but a green meadnw. The crowded metropolis was existing only in the germ, and that merely a few straggling streets close to the water's edge. George II. was on the throne of England, and Louis $X V$. on that of France. Both amiable sovereigns were struggling to monopolize as much of North America as possible; and although at the time peace reigned in the colonies, it was but a temporary one, which ended in still fiercer hostilities seven years later. Sir Isaac Newton had been dead for six years, and the mathematicians of England were arering, with an acrimony intensified by international jealousy, over the theory of gravitation. Newton had studied out the subject of electricity and had invented the glass globe machine. Steph• nGray had also made some investigations, but no one had ventured a thrcry, nor had an application of the new pbenom. na been euggested. Telegraphy, the galvanic battery, the ionumerab.e inventions based thereon, were ail things of the future. There were plenty of alchemists in Europr, and the science of chemistry was just wrenching itself free from connection with their chimerical philogiston, a substance whi•h Cavendish in subsequent discoveries believed identical with hydrogen. But the transition period in chemical science was yet nearly forty years distant. Priestley, the discoverer of oxygen, was but an infant. Black, the investigator of the alkalies,and Scheele, the inventor of modern organic analysis, were likewise children. Out of the sirty-three elements, but fifteen were known. Aluminum, chlorine,orygen, hydrogen, nitrogen, platinum, and nickel were among thone which had never been recognized.
Newcomen's stemm engine was used in the mining dis-
tricts, and the boy, who sat beeide it and worked the condenser valves, had not been struck with the brilliant idea of making catches and strings perform the labor in his stead. The Marquis of Worcester and James Watt were unknown
to fame. The first railroads were in use in the coal districts to fame. The frst railroads were in use in the coal districts
of Northumberland and Durham, but the rails were nothing more than wooden beams, and iron was not to be substituted for them for thirty years. In the blast furnaces wooden bel lows were in use. Puddling,rolling, and the hot blast were un
known. In Europe cast steel had never been made, and but a short time had elapsed since the publication of Réaumur's work, makingknown the process of manufacturing ordinary steel. In this country Jonah Higby's patent, obtained from the Connecticut legislature, for a "curious art to transmit common iron into good steel" had just run its term of ten years. Having no autonomy as a nation, we had no patent
righ, surtom in those days, and even civilized France had
effort toward establishing one. The arts of photogrspty or sun painting in any form were undreamed of The sciences of aeronautics and of agricultural chemistry had never been imagined. Surgeons hacked off the limbs of their victims and seared the flesk with red hot irons, regardless of the agony they inflicted, for anæsthetics were un known. The phenomena of digestion were but little under stood, and quinine, with hundreds of other remedies now comimon, had not been discovered.
Whale oil was burned in the lamps, which formed the sole means of illumination when candles were absent. Petroleum, paraffin, and illuminating gas were yet to be found. In artillery and implements of war, the bayonet had just superseded the pike, the flint lock mulket was just coming in to use, while a single monster cannon of the present day would have dispersed whole regiments armed with the primitive artillery then employed.
Laplace had not given his labors to the world. Saturn's rings and aatellites had not been discovered, and the path of that planet was supposed to be the outer bound of our solar system. The spectroscope had made none of its wonderful revelations, and the distances of the flxed stars, their ap parent motions, and the fact of their being suns and centers of other systems, the 5,700 nebulæ, and the 136 asteroids, al were unknown.
India rubber had been discovered one year. There wat no definite system of botany, and Cuvier's researchea in natural history had not appeared. The caloric engine, the hy draulic press and ram, the sewing machine, and the diving bell had never been thought of. Blowpipe analysis and the atomic theory, a system of logarithms, calico printing, the
steam printing press, all were yet to be invented. No one steam printing press, all were yet to be invented. No on
had deciphered the inscriptions on the monuments of Egypt. Jenner had not introduced vaccination, nor Hahnemann homœopathy as a school of medicine. Steam navigation and the screw propeller were yet to appear. Captain Cook wa making his celebrated voyages around the world. Immense portions of Australia, of Africa, of the polar regions, had never been visited by civilized races. Anthracite coal had to Scienen burned, nor the powerful explosives now was known as a profession on this side of the Atlantic, and arti ficial teeth had not been invented. The first chronometer had not been completed. The pianoforte was a new-fangled in vention, which no one would have aught to do with until his Majesty Frederick the Great of Prussia deigned to buy one ten years later. Polarized light had not been discovered. No post office system had been developed by any government nor had any improved means of teaching the deaf and dumb
been adopted. Steel pens were unknown, and the Scientrfic American was not one of the seven newspapers then existing in North America.
Our retrospect already extends ibeyond intended limits, and we have far from even summarized the great discoveries zurpass ast century and a half. That our descendhe win bound of probability. When our celestial visitor again ap pears, as it will in the year 2011, it will reveal itself to the gaze of earthly inhabitants, regarding the magnitude o whose knowledge and whose powers it would be idle even to speculate.

## TAXING POWER OF THE LEGISLATURE.

Law, in its true sense, is the product of the highest reason coupled with the most exact justice. The Civil or Roman Law and the Common Law of England are to be admired as
models. The great deviations from genuine law are to be models. The great deviations from genuine law are to be
found in arbitrary acts of our State Legislatures, seriously found in arbitrary acts of our Stato Legislatures, seriously
affecting the rights, liberties, and property of individuals, and the tendency of the courts to give validity to such act in contravention of constitutional guaranties and those of the common law.
The most notable instance of this may be found in such legislative acts as provide for the disbursement of large sums of money in making public improvements, and then charging the whole cost as a tax on epecific individual prop erty without the consent of the owners, and, as has some times happened, to the entire confiscation of the pro perty. The power of the legislature to do this, and to act as the final judge on the propriety of any public improve ment, from which the individual has no redress, although
ruined thereby, is now, as we understand the law. laid ruined thereby, is now, as we understand the law. laid down
by the Court of Appeals of the State of New York. This doctrine is so arbitrary in form and so destractive of individual rights that it becomes a reliof to know that our sister State of New Jersey, through Chief Justice Beasley, of its Court of Errors and Appeals, lays down a much mild
er and wiser rule for that State, in a recent decision made
by him at the suit of "The Mayor and Common Council of Newark aids. The State, Agens et al
The facts were that a certain street in Newark had been repaired under an act of the legislature which provided that two thirds of the cost should be imposed on the owners of lots fronting on the line of the improvement, and one third on the city treasury; and the question was whether the legis lature could fix, at its mere will, the ratio of expense to be
put upon the owners of the preperty along the line of the improvement. The following is an extract from the very able opinion of the Chief Justice, fully concurred in by his associates, and well
this and other States:
"*
"* * ${ }^{*}$ That the effect of such laws may not extend be yond certain prescribed limits is perfectly indisputable. It
is upon this principle that taxes, raised in countjes, towns is upon this principle that taxes, raised in countses, towns
and cities, are vindicated. But while it is thus clear that and cities, are vindicated. But while it is thus clear that
the burthens of a particular tax may be placed exclusivel on any political district to whose benefit such tax is to $\in \mathrm{n}$ ure, it seems to me it is equally clear that, when such bur then is sought to be imposed on particular lands, not in themselves constituting a political subdivision of the State
we at once approach the line which is the boundary we at once approach the line which is the boundary
between acts of taxation and acts of confiscation. I think it impossible to assert, with the least show of reason, that the legislative right to select the subject of tax ation is rot a limited right. For it would seem much more in accordance with correct theory to maintain that the power of selection of the property to be taxed cannot be contracted to narrow er bounds than the political district within which it is to op
erate, than that such power is entirely illimitable. If such prerogative has no trammel or circumscription If such prerogative has no trammel or circumscription, improvements can be placed by the force of the legislative will on the property of a few enumerated citizens, or even on that of a single citizen. In a government in which th legislative power is not omnipotent, and in which it is a
fundamental axiom that private fundamental axiom that private property cannot be taken
without just compensation, the existence of an unlimited Without just compensation, the existence of an unlimite
right in the law-making power to concentrate the burthen of a tax upon specified property does not exist. If a statute should direct a certain street in a city to be paved, and the expense of such paving to be assessed on the houses standing at the four corners of such street, this would not be an ac of taxation, and it is presumed that no one would assert it
to be such. If this cannot be maintained, then it follows that it is conceded that the legislative power in question is not completely arbitrary. It has its limits, and the only in quiry is where that limit is to be placed.
So far as the particularized property is specially benefited an exaction to that extent will not be a cond mnation o property to the public use, because an equivalent is returned
and this is the ground on which the abnormal burthen put and the land owner is justified.
Speaking on this subject, Chief Justice Green says: 'The theory upon which such assessments are sustained, as a legitimate exercise of the taxing power, is that the party assessed is locally and peculiarly benefited, over and above the ordi nary benefit which, as one of the community, he receives in all public improvements, to the precise extent of the assess
ment." ("State $v$. City of Newark, 3 Dutch. 190.) It follows ment." ("State $v$. City of Newark, 3 Dutch. 190.) It follows then, that these local assessments are justifiable on the groun
alone that the locality is especially to be benefited by the out alone that the locality is especially to bes benefited by the out reason can be assigned why the tax is not general. An as sessment laid on property along a city street for an improve ment made in another street in a distant part of the same
city would be universally condemned both on moral and city would be universally condemned, both on moral and
legal grounds. And yet there is no difference between such an extortion and the requisition upon aland owner to pay fo a public improvement over and above the exceptive benefi received by him. It is true that the power of taxing is one of the high and indispensable prerogatives of the government and it can be only in cases free from ail doubt that its exe cise can be declared by the courts to be illegal. But such a is specified out of which a public improvement is to be paid for specified out of which a publy imparted to it by such improve ment. As to such excess, I cannot distinguish an act exacting its payment from the exercise of the power of eminent domain In case of taxation the citizen pays his quota of the common burthen; when his land is sequestered for the public use, h contributes more than such quota; and this is the distinction
between the effect of the exercise of the taxing power and betweon the effect of the exercise of the taxing power and
that of eminent domain. when, then, the overplus beyond that of eminent domain. when, then, the overplus beyond
benefits from these local improvements is laid upon a few landowners, such citizens, with respect to such surplus, ar required to defray more than their share of the public outlay and the coercive act is not within the proper scope of the
power to tax. And as it does not seem practicable to define power to tax. And as it does not seem practicable to define yo area upon which a tax can be legitimately laid, and cannot be legitimately extended, and as ther is, as has been shown, necessarily a limit to the power of se is, as has been shown, necessarily a limit to the power of se
lection in such instances, the principle stated in the case cited is, perhaps, the only one that can be devised whereby to gra uate the power. Consequently, when the improvement, a in the present instance, is primarily for the public welfare, and is only incidentally for the benefit of the landowner, the rule thus.
A full roview of this able decision and the cases it cite would interest and instruct all lovers of sound law. It im parts the good old doctrine that States and Legislatures ar aly the product of an aggregate of individuals, created alik for the general and individual good, and not to be the mean of oppression or extortion of the highest or the most weak and humble citizen

## RECENT PRINTING PRESB IMPROVEMENTS.

In the working of nearly all printing presses the sheets of paper are supplied by hand, the workman being known as " "feeder." Each sheet must be taken up singly and exactly laced on the feed board, where it can be seized by the prese ippers at the propermoment, and carried to the types. Any arelessness on the part of the feeder results in bad printing and the spoiling of sheets. Measured by the manual forc xpended, the feeder's labor is slight; but no press can be run, not even for the smallest job, unless the feeder is on hand to place the sheets, while his intiorable weekly wages
are a serious expense in every printing office. Many have been the attempts made, extending over a period of twenty
five years past, to substitute mechanism for this species of hand labor, but without much success until the present time. We have recently had the pleasure of witnessing, at the ex-
tensive press rooms of the Independent newspaper, Rose tensive press rooms of the Independent newspaper, Rose street, in this city, the practical operation of a mechanical feeder which is, apparently, the perfection of success. It takes up the sheets separately upon a steel point, carries them forward and delivers them to the nippers, between the adjustable guides, with almost infallible accuracy. Every contingency seems to be provided for. If by any possibility the device fails to place the sheet properly, or fails to feed, the press instantly stops. If two sheets in the pile are by any means tucked or folded together, or if two sheets are lifted, the press stops. All inaccuracy of feeding, or the running through of doubles or "packets," is prevented, and much spoiled work obviated. The first move or slide of the upper sheet of the pile is given by a rubber-faced presser, no air suction being used. The apparatus is suited to nearly all presses, and is quickly adjustable to sheets of various wizes.
When we consider that there are some thirty thousand power printing presses now worked in the United States, to which this improvement is applicable. its importance becomes in some degree apparent. It is believed that the invention will save its cost in less than a year by its diminution of spoiled sheets, to say nothing of its saving in the wages of feeders. It is applicable to steam, lithographic, and other presses used in color printing, and it will greatly reduce the cost of producing fine chromo pictures, some of which are required to be fed through the press from twelve to twenty times, a separate impres ion being necessary for each shade or print of color. Mr. C. E. Baker, the superin. tendent of the Independent press rooms, 21 Rnse street, New
York city, will furnish additional information concerning York city, will
this invention.

## PATENTED CAR IMPROVEMENTB

Tro or three years ago the Master Car Bailders' Associa. tion adopted, as a plank in their constitution, the brilliant idea of excluding from discussion af mention of patented devices concerning railways. If any man patented a car that could be built equally as strong as the present cars for half the money, or if he should invent and patent a truck that would not leave the track, and thereby greatly improve the safety of card, preventing loss of life and property, he was forbidden to explain its merits before the Association, and that enlightened body could not, officially, take any cognizance of the new discovery.
There is no mistake about it that the discussions of the Master Car Builders,composed, as they are of practical, wideawake men, are of great importance in imparting and circu lating sound, valuable information about the needs and merits of railway vehicles. We doubt whether there is a
more able body of practical workers associated together in more able body of practical workers associated together in
any of the various branshes of American industry than these any of the various branshes of American industry than these
same car builders; and how they could ever have permitted same car builders; and how they could ever have permitted
such a streak of narrow-mindedness as this anti-patent desuch a streak of narrow-mindedness as this anti-patent de-
claration to creep into their constitution is to us quite unaccountable. At the late session of the Association, one of the members, in discussing the merits of various car roofs, was taken to task because he had spoken well of somebody's pat. ented roof. Butit was alleged in reply that,if the Association had done wrong heretofore in such matters, it was time that correction should now be made, for it was demonstrated that, in order to make progress, the Association must, of necessiare best. To patentediap conclusion, and one that almost any old lady would have come to without waiting three years, or stirring up bile in the family.

## THE MINES AND MINERALS OF INDIA

For ages unnumbered, Indic has been famous for wealth in precious stones. Our geographies still speat of it as a land of gold and diamonds; and the popular idea is that its mineral resources are immense and inexhaustible.
So much for current fame. The facts of the case, as developed by the labors of the government geologists, show a very differont atate of things. The greater part of the vast area of the Indian Peninsula is either destitute of valuable minerals, or they occur in a manner which throws serious obstacles in the way of their utilization; while in the richer districts, the real mineral wealth lies not at all in the mines for which the country has been celebrated. The only diamond mines that pay or promise to pay for working are of the " dusty" variety, more useful for fuel than for ornament ; and its precious ores are chiefly those of iron,as yet but little developed.
Copper occurs in many parts, and is mined in several places among the Himalayas, especially in Kamaon, Gurhand the product is so incongiderabse are worked by natives, mines are most abundant-in Kamaon,-it is insufficient to supply the local demand. In the alluvial plains of Northern India, the copper-bearing points are few and the yield insig. nificant. In the metamorphicareas of the eastern and southern parts of the peninsula, where metallic ores occur but sparingly, the principal points, at which copper mines have
bern worked by the natives at various periods, are in Rajbern worked by the natives at various periods, are in Raj-
putana, the countries southwest of Bengal, and in the Presiputana, the countries southwest of Bengal, and in the Presi-
dency of Madras. At present the only works regularly carried on are near Jaipur, in Rajputana. Ancient workinge abound near Chaibassa, in Bengal, where an extraordinary series of deposits occur, partly in lodes, partly disseminated through schists, and extending for a distance of eighty miles. Much fine ore still remains here, chiefly carbonate and red
oxide of copper, with copper glance occasionally; but at tempts to re-establish the workings by European miners have never proved successful.
Lead is less abandant than copper, with which it is com monly associated. Rich veins of galena are said to occur in Kulu, in the Northwestern Himalayas, and more sparingly in Gurhwal and Sirmur, but little has been done to ward de veloping them.
Tin has been reported from two to three localities in the plains of India proper, but nothing is accurately known of its occurrence. Rich tin deposits are believed to exist among the mountains between British India and Siam, the same range which affiords the well known stream deposits of Malacca, farther south: but the inaccessible character of the country has hitherto prevented any attempts to work them. Silver is said to occar with the galena in Kulu, and with certain copper ores in Deogurh, but the quantity is small. The Deputy Superintendent of the Geographical Survey The Deputy Superintendent of the Geographical Survey
visited the latter place, but could find no evidence of a vein or other regular deposit of the ore. Gold is found in many parts, but always in very small quantities, in etream gravels. It is extracted by rude processes of washing, and the yield is so small that none but the poorest of the natives engage in the search, and these only in the spring, when agricultura work is suspended.

Small quantities of an ore of cobalt are found near Jaipur, in Rajputana, and are used for the coloring of enamels. Anti mony occurs in Kulu and Lahaul, avd zinc at Jawad in Mewar. Chromic iron ore is found near Salem, in the Madra Presidency.

Considering the immense area of India, its share of the more precious metale must be rated as extremely small. Nor is it probable that future discoveries will greatly in the cesperces in this respect. For thour of year the country has been thickly populated by natives familiar
with at least the rude processes of mining and metallurgy ; with at least the rude processes of mining and metallurgy;
and as the remains of extinct and in many cases ertenaive workings abundantly testify, the country has been thoroughly exp'ored. Besides, with the abundance of labor at the
absolute control of the rulers, it has been possible to work absolute control of the rulers, it has been possible to work
mines, especially for gold and precious stones, which would not pay expenses with hired labor. Eren the diamond workings, which helped to supply the ancient rulers with their stores of gems, were very likely carried on at a cost of labor which, if paid for, would greatly exceed the value of the proceeds.
The diamond bearing districts are chiefly in the country around Karnul, Kuddapah, and Ellore, in the Madras Presi dency, near Sambhulpar on the Mahanadi; at Weiragad southwest of Nagpur, and at Panna, in Bandelkband. O late years comparatively few diamonds are found, and the few attempts that ha
proved unprofitable.
Of rubies, sapphires, and other precious stones, India is quite destitute, though they are found in Ceylon, Independ ent Burma, and in the countries northwest of the Himalayas. The best that India can offer for jewelry are agates, cornelians, and other forms of quartz derived from the trap rocks of the central and western portions. Corundum occurs in Mysore and Salem, also in Rewah, where there is a bed several yards in thickness, associated with jade.
Infinitely more valuable than the gold and gems of the past are the salt beds of the present. The deposits of this homely yet necessary substance in the salt range of the Pun jab furnish upwards of fifteen hundred millions of dollars a year to the revenue of the government. The deposits are
practically inexhaustible, and for extent and purity have no known rival. The prevalent color is white, sometimes tinted pink or reddish, the mines forming crystaline grottos of in describable beauty. Another kind of salt is found in great quantities in the Trans-Indus county of Afganistan, occur ing in masses in the bads of ravines; and though less white han that of the Punjab, is consilered more savory.
More important than the salt mines are the extensive de posits of coal. So far as explored, the coal fields of India the neighborhood of Calcutta, and from a line roughly par allel with the coast of the Bay of Bengal and distant from it between one hundred and one hundred and fifty miles, to about the 78th parallel of east longitude. On the north it is bordered by the plain of the Ganges, and on the south it ex tends locally a little beyond the Godavari. Outside of this area, the onlycoalfields of promise are those of Upper Assam. The geological age of these coals, long in dispute, has now
been clearly ascertained to be that of the Australian coal, been clearly ascertained to be that of the Australian coal,
differing little if at all from the carboniferous of Europe. A few deposits of lignite occurin the Punjab, but they are small in quantity and inferior in quality.
Geographically the coal fields of India are roughly divided nto four groups: 1. Those of Bengal, including the coals of the Rajmahal Hills and those of the valley of the Damuda 2. Those of Rewab, Sirguja, Bilaspur, Chutia, Nagpur, and the tributary mehals of Orissa. 3. Those of the Nerbudda valley and the hills to the south of it. 4. Those of Chande and the Godavari.
The principal field is that of Raniganj, beginning about 20 miles northwest of Calcutta, and extending northward about eighteen miles, with an extreme breadth of fourteen
miles. This field supplies about half a million tuns a year ten times the yield of all the other fields togather. The seams which are mined vary in thickness from 47 to 35 feet, and are individually variable. Eighteen distinct coal-bearing areas are enumerated in the several groups, but the most of be made of their contents. In all the basins the coals are mostly concentrated in one bed of great thickness, consisting

of alternations of coal and shale, and the beds thin out ra pidly to the west. In the Raniganj field, where the forma tion attains its maximum thickness, the upper group is 5,000 feet thick, the lower 2,000 , each containing several seams of coal. To the west the upper group is replaced by rocks con taining no coal, while the lower diminishes greatly in thick | nees. |
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| Scarc |

Scarcely anything is known of the Upper Assam fiel ls rave that there are several seams and the coal is of excellent
quality, containing only two to five per cent of ash. Unforquality, containing only two to five per cent of ash. Unfor tunately these deposits are almost at the extreme east end of the Assam valley, in a country thinly inhabited and hard to be got at. Some of these coals are said to coke while burning; but with this exception, the Indian coals are all free burning and will not form coke. Generally, too, they are very lean, containing from ten to thirty per cent of ash. For mechanical purposes, they are little more than half as Faluable as English coals, and are consequently unfit for use valuable as English coals, and are consequently unfit for use
in fea going vessels, owiog to the great bulk and the labor in rea going vessels, owiog to the great bulk and the labor
of handling. Unless they can be made available for smelt of handling. Unless they can be made available for smelt-
ing purposes, especially for iron, the demand for them will be restricted almost entirely to railway use, river steamer and stationary engines. It is hoped, however, that with pro per selection and care they may be made available in the manufacture of iron; in which case the greatest possible im pulse will be given to coal mining, and there is reason to believe the immediate future will bring to India an iron age of productive wealth compared with which the barbaric splendor of the past will be as nothing.
Unlike the ores of the rarer metals, those of iron are wide ly and generously distributed throughout India, some of the deposits being unsurpassed in quality and abundance. The more valuable of these deposits are of magnetic and specu lar ores and red hematite, in beds or veins among metamor phic sub cr, staline rocks; for size and character, they re mind one of the iron mountains of Missouri. There are, be sides, clay iron ores in the coal-bearing strata and beds of brown hematite in other stratified ro'ks; also surface de posits of magnetic iron sand, and nodules of brown hematite which supply the ores chiefly nsed by the native smelters. The most remarkable deposits are near Salem, in the Madras Presidency. They consist of immense beds, from fifty to a hundred feet or more in thickness, the outcrop ex tending frequently for miles. One of these forms the ridge of a hill 1,500 feet high and four miles long. Another hill of equal length, not far distant, contains five bands of magnetic ore, from twenty to fifty feet thick, which can be traced all round the bill. These are but two iustances out of many that might be cited from this locality. At Lohara, in the Central Provinces, a hill two miles long and half a mile wide appears to consist entirely of specular and magnetic de which yields 70 per cent of metallic iron.
The deposits of hematite, though on a less imposing scale, are often of great extent and ricbness. The clay iron ores are similar to those of the English coal fields, and the quan tity large. A great number of specimens from the Rani ganj field yielded on assay an average of 39 per cent of iron. Thus far the few attempts to manufacture iron in India on a large scale have, for various causes, resulted in failure. There is no reason to doubt, however, that the diff culties will be overcome, and these vast beds of iron ore be made the sources of immense industrial activity and wealth.

The Next Fair of the American Instifute.
We have received the usual pamphlet containing the an nouncement of the 43 d fair of the American Institute. The exhibition will be held in the same building as last years on Third avenue between 63d and 64th streets in this city and opens, for the reception of machinery, August 17, 1874 Goods will be received from the 31st of the same monib,and the formal opening to the public takes place on the 9 th of September. Unless it be deemed expedient to continue the fair an additional week, the 14th of November is designated as the closing day.
Some changes have been made in the classification of en tries, and the number of awards bas been increased to nine. They now consist of gold medals of honor and progress, a medal for taste, a silver medal, a bronza medal, diploma, and special diplomas for continued saperiority and excellence and for coöperation.
We would remind intending exhibitors of the necessity of early preparation. There is plenty of time afforded, to have everything in readiness before thefairopens, and so to avoi the confusion which usually occurs during the opening week.

## Cincinnati Industrial Exposition

The success of the expositions held annually in Cincinnati or the past four years has justified the managers in enlarg ing their space and extending the field of operations. The very elaborate circular now before us contains over 90 premiums to be awarded for excellence in all department of manufactures, domestic industry, agriculture, science, and art. Although the space at the disposal of the manage ment is very large, it is deeirable that early application be made or allotments, as the wish to exhibit at these expositions be comes more and more extended. The buildings will be open for the reception of goods from Auguet 3 to September 1 and the exposition will open to the public on September 2 and will remain open till October 3. Applications for in formation and documents must be addressed to W. P. An deran, Secretary, Cincinnati, 0.

Powderid chalk, added to common glue, strengthens it aglue which will resist the action of water is made by boil ing one pound of glue in two quarts skimmed milk.

