## Srientifit Ammerican.

MUNN \& CO., Editors and Proprietors. publibeed meekiy at
NO. 87 PARK ROW, NEW YORK

## o. D. munn. <br> A. e. beach.

## EERDK

One copy, one yarf.
One copy, dix montids

$\$ 300$
150
2500
250
50
50
VOLUME XXXI, No. 11. [New Series.] Twoenty-ninth Fear.
NEW YORE, SATURDAY, SEPTEMBER 12, 1874.


## can we stay?

It is time some one stood up for his country : some Ameri can, we mean. Not for its present prosperity and immediate prospecte, there are plenty to do that: but for its distant past and distant future. We are tired of hearing the Conti. nent called a graveyard of nations, the tomb of antecedent races, the one spot on earth which man cannot permanently inhabit
It is bad enough to be told, by would be wise ethnologists that our climate is hostile to the Aryan type, that an irre sistible Indianizing influence pervades the air and is rapidly converting us all into lean, high cheeked, bilious-looking copies of Mr. Lo; and that our great grandchildren will be no better than so many Sioux. But thatis not half so bad as to be told that it is a question whether their deecendants will be able to stay here at all, except underground. Any existency is better than extinction : and it is possible to hope good things of our race even if it should assume the physi cal characteristics of the so.called American type.
The latest advocate of the extinction hypothesis is the somewbat prominent author of "Sex in Education." His essay, read before the National Teachers' Association the other day, set out with the discouraging announcement that no race of human kind has yet obtained a permanent foot hold on this continent ; add the lesson he sought to enforce was that, unless something extraordinary is done, we are doomed as a race to untimely extermination. The Asiatice he said, trace their life to beginnings immensely remote. The descendents of the Ptolemys still linger in the valley of the Nile. The race which peopled Northern Europe, when Greece and Rome were young, more than maintains its an-
cient place and power. But the ancient races of Americawhere are they? "We only know that they are gone."
When Dr. Clarke talks of "Brain Bailding" and the "Education of the Sexes," he says much that is sensible and true: but when he infers our early destruction by climatic influences from the fact that other American races have van ished, our confidence in his judgment is seriously shaken Grast that vestiges of two or more departed races are to b found within our borders, and that when the Mayflower dis charged her marvelous cargo of cottage furniture to furnish heirloome for all Now England, the native race were hasten ing to the happy hanting grounds at a rate which whisky and gunpowder have but slightly accelerated: does tha prove American races to be short lived? Rather let us call it evidence of exceedinglong life. Where else on earth will you find so few races bridging over so vast an interval of time?
When the pioneers of Italy and Greece, wild as Mohawke, fought their way into Europe, a peaceful and popalous nation-whose unhappy remnant bas lately given a Presi dont to Mexico-was cultivating maize in the valley of the Mississippi, mining copper at Lake Superior, and building temples in the South. The man of the Florida corals ante dates not merely the Ptolemys-men of yesterday-but the Pharoabs, the shepherd kings, it may be the very land they Owned and ruled. What wonder that his lineage is lost? We know from recent exploration that the desert regions of then the sea has dried away, and across its sandy bottom the

Nile has laid its annual layers of mud for the creation of the ancient granary of the world. There is geological evidence hat, when the first mud layer was put down, a broad fresh water sea covered the now barren Bad Lands of our grea West. There is similar evidence that men dwelt on it hores and fished from its headlands.
Since the pioneers of Western Europe sought shelter in the caves of France and Belgium, the Somme has sunk its bed through a hundred feet of gravel. Since a settled population fourished on the then fertile, now arid, plains of the Colorado that stream has cut its mighty cañons deep in earth through two, four, perhaps six, thousand feet of solid rock! When the upper strata of the Himalayas were in process of deposition, and before our Aryan fatherland began its upward course in civilization and altitude, human beings were fishing among the islands of our Pacific coast, since lifted up to form the Coast Range. Ages afterward, when the Golden Gate had been opened and California drained of the sea which had filled the valleys of the Sacramento and San Joaquin, but before the gold gravels were ground into exist ence or buried beneath lava floods, other men came in and occupied the land, leaving their remains, with those of ani mals long extinct.
Yet because we cannot trace these nations historically throurh intervening ages, because they seem to represen a number of distinct successive races, shall we olame the climate and call the land inimical to humanity?

## PREPARE FOR THE CENTENNIAL

The short timeintervening betwean the present date and the opening of the Centennial Exhibition renders it imperative that intending exhibitors should begin their prepara tions at once. We need not urge the fact that, owing to the magnitude of the affair and the large interests involved, the delays, so common in our yearly fairs, caused by not transmitting objects for exbibition until the last moment, will not here bs possible. The Centennial commission has announced its readiness to receive applications for space, so that this mportant matter can now be definitely settled, leaving nothing to be done but to get the articles ready in conformity with the area of surface secured. Applications should be made immediately, in order that the commission may be allowed time to decide on the amount of room to be as signed to foreign nations. Lack of promptitude, therefore on the part of intending exinibitors will probably result in their finding the space desired already occupied by less terdy applicants or set apart for foreign contributors.
Those most directly interested at the present moment are manufacturers who propose making large entries which will take time to construct or arrange, and the people who contemplate collective exhibitions of the natural resources or
raw materials of different sections of the country, which can not well be made by individual exhibitors.
It is especially desirable that provision for these aggregate contributions should be speedily made. The importance of the plan, as an incentive to immigration and to the investment of foreign capital, is very great: and liberal arrange ments for the prompt and thorough performance of the work will amply repay those States or communities which undertake it.
The advertisement of the Director General of the Centen ial will be found in another column, and from it may be earned how applications should bo made. It is high time that the public should realize the fact that, leaving out all debatable questions as to its expediency as a national enter prize, our Exposition of 1876 is not an abstraction, as serm be the prevalent idea, but something upon which work, now commenced, is briskly progressing. Grou roken, and the foundations of the great buildings are be inning to appear. Foreign commissioners have already established ofices among us, and foreign governments have
set apart liberal sums of money to ensare the representation of their industries. If we propose to make the fair a fit elebration for the anniversary which it commemorates and worthy of the high industrial and intellectual standard of our people, we must begin work for it at once-not at some vague,future period in next week, next month, or next year but, earnestly and emphatically, now.

## PENHOLDERS.

Goosequills are round: consequently penholders are round Professor Syllogism might dispute the logic of this observa ion; it is correct, nevertheless. Evolation-the cleares expression of the Great Artificer's will in Nature-is the one unbreakable law which determines the products of human nvention. Solomon's assertion that there is no new thing under the sun was therefore true in a wider sense than the kingly preacher imagined. In Natureand in Art alike, every hing is the offspring of something gone before; and how ver unique it mey beem at first aight, it will prove on ex amination to be only a more or less modifed copy of some thing else.
Downward Prom the first metal worker, whose weapons and implements of bronze were exact copies of those his neighbors were toilsomely chipping from stone-thus al owing the necessities of one substance to determine the rashion of objects made of another, of entirely different char acter, by entirely different processes-one may trace the
tendency of men to perpetuate form, 9 venat the cost of sacrif ingncy of men to perpetuate form,9ven at the costofacrif and the mode of working, to correspond; but the figure re mains, as though to justify Goethe's assertion that form alone is real.
The original maker of metallic pens could do no other than imitate the time-honored goosequill, thrusting a round stick into the end of the barrel for a holder. Subsequently
the barrel was taken from the pen and made a part of the holder, which has since teen modified in numberleas waye, without departing essentially, however, from the cylindrical form. Accustomed to this ghape, we can with difficulty think of any other. Indeed, so strong is the natural feeling that whatever is is right, it is more than likely that, if our readers were individually asked why a penholder is round, he majority would reply: "Because that is the proper hape.'
But the argument from universal assent, so convincing to the theologian, is practically as little worth in matter of fact as in matters of faith. At best it only proves the matter not intolerable. Penholders are round because no on d bas ever made them otherwise. It by no means follows that a change ould not be beneficial
Place your thumb and forefinger against the second finger as in ihe act of grasping a pen, and notice the shape of the space between them. It is triangular. It is easy to puta round stick into a three cornered hole; but it needs no mechanical genius to see that it will not make the closest possible fit.
To write steadily and with a uniform slope, the pen needs to be firmly held in a fixed position. To write easily the pen mustlie in the hand naturally, so as to maintain its position with the least effort. With a rolling penholder, these conditions are but poorly met. The contrary obtains with a three-sided holder, which presents a broad surface to each side of the finger's triangular grip, and gives a steady bold, without apparent pressure and without appreciably separating the fingers. The advantage of a triangular holder over a round one in the last paricular is very great; and we are confident that holders so made would rapidly superse de the present style if once placed in market.
There is reason to make the change, and pen stick makers will do well to consider it. Should it be made, would the ogic of our first observation be impaired? Would the new form have any other reason for being than the fact that it is the best form? No, and yes. It is the best form unquas. ionably; yet it owes its existence not to that, but to the ap parently irrelevant fact that horsefoot crabs have three-cornered tails!
Visiting the seashore, we chanced to find the empty shell of one of these singular creatures. While holding it up by its spiky tail, a friend, of the sex that is said to have no in ventive genius, remarked that the tail would make an odd penholder. The suggestion was carried out, and the product was odd enough. But it was something more. It was a revelation of a needed reform in penholders. We have used it for weeks, with a daily increasing conviction that the goosequill was an unfortunate model. The perfect penholder is three-sided.

## THE MICROSCOPE AS A CRIMINAL DETECTIVE.

The annals of criminal jutisprudence furnish an abundnce of cases in which the microscope, in the hands of an expert has been the means of eliciting missing links in the circumstantial evidence pointing to the guilt of the accused. nstances are cited where the instrument has shown hairs, clinging to the edge of an ax, to be those of a human being, in direct contradiction of the statement of the prisoner, ascribing them to some animal; and similar scrutiny of fresh blood upon clothing has proved the origin of the stain beond a reasonable doubt.
When blood, however, has once become dry, several auhorities assert that it is impossible to distinguish it from that of the ox, pig, sheep, horse, or goat. It is urged that the differences between the average sizes of their corpuscles are too irregular to measure acrurately, and that a man's life hould not be put in question on the uncertain calculation of a blood corpuscle's ratio of contraction in drying. In oppoition to these views are some recent experiments, mede by Dr. Joseph G. Richardson, of Philadelphia. This investigation disposes of the first objection above mentioned by pointing ut that, while it may be valid as regarde feebly magnified blood disks, it becomes void when these bodies are auplified ,700 times. Regarding the second, Le stamps it as incorrect, and cites a case in which seven human blood dieks, whose mean diameter had been accurately determined at $32 \frac{1}{36}$ of an inch, were subsequently computed to average उदे66, or only $35{ }^{2} 20{ }^{2}$ of an inch lesa than their actual mag. itude Dr. Richardson also pointa out, with reference to he last objection, that, all the blood disks likely to be mistaken for those of man being normally smaller, instead of contracting they would have to expand to become conformed o those of human blood. This expansion does not occur so that the only possible mistake in diagnosis would be to suppose that ox blood were present when man's blood had actually been shed; so that at the worst wemight contribute o a criminal's eacape, but never to the punishment of an in nocent person.
In order to afford a positive demonstration of the factr, Dr . Richardson obtained, from each of two friends, three specirens of blood clots, from the veins of a man, an ox, and a heep respectively, selected without his knowledge. By nicroscopical examination slone, he was able to determine, with perfect accuracy, the origin of each sample. The cor puscles of human blood averaged $\frac{31}{3 \pi} \pi$, with a maximum
 a mum of $\frac{13}{4 \pi}$ and a minimum of ; while those of the sheep's blood afforded a mean of $\frac{1}{9} \frac{1}{92}$, with a maximum of 5458 and a minimum of ${ }_{6 \times 1} \frac{1}{61}$ of an inch.
From these and other experiments, Dr. Richardson concludes that, since the red blood globules of the pig, ox, red deer, cat, horse, sheep and goat " are all so much smaller

