SCIENCE

FRIDAY, JUNE 8, 1888.

SCIENCE CAN FAIRLY CLAIM the honor of having placed the discussion concerning the New York public-school system on the proper basis. The task of educating public sentiment has now been undertaken by one of the most influential journals of the metropolis, — the *Sun;* and in the forefront of its discussion, serving almost as the text for what follows, stands our editorial comment of two weeks ago. Educators in all parts of the country are following the discussion in this city with intense interest, and while it is not in our province to enter too extensively into detail, yet we purpose to keep our readers apprised of the progress of the battle; for it is a battle, in every sense of the word, — it is a battle between right and wrong, between educational progress and enlightenment and educational incompetence. The result will be either to free the schools and their hundreds of thousands of pupils from the deadening influence and control of a political ring, or it will fasten that influence and control on them more surely than ever. If the thinking citizens of the metropolis can be brought to appreciate the real nature of the alternative, the result cannot be for a moment doubtful. From all parts of the country, protests should be sent to the authorities in New York in order that they may be made to see that the country's intelligence and the country's conscience are fully aroused in this matter.

IN THE CURRENT ISSUE of the *Forum*, Ex-President Andrew D. White of Cornell has a suggestive article on 'The Next American University.' It is nothing less than the skeleton of a plan for a national examining university, with sufficient funds to bestow fellowships, scholarships, and travelling bachelorships. Its strength lies in its co-operation with existing institutions of collegiate grade. Its weakness, as a plan, is the immense amount of money required to put it in operation. It would furthermore be difficult to select a suitable chancellor, or, at all events, a succession of suitable chancellors, for such an institution, without incurring the hostility or jealousy of some sectarian body or some educational faction. The ordinary college has an historic policy of its own, and the president is to execute and develop it. In such an institution as Mr. White has in mind, the chancellor would be university, policy, and every thing else, so long as he held office. But if the money is forthcoming, let the plan be tried, and let Mr. White be the first chancellor.

THE WASHINGTON SCIENTIFIC SOCIETIES have suspended their meetings for the season after seven months of remarkably successful work. Every session has been well attended, and there have been more papers than there has been time to listen to. Many of these have reported important progress in original investigation, and many others have described work which, although not pushing out into new fields, has perfected and filled up gaps in the work in old ones. The three leading societies — the Philosophical, Biological, and Anthropological — have, by their co-operation, maintained the annual course of Saturday afternoon free scientific lectures. These have all been of a high order, and have been listened to by intelligent audiences that have filled to its utmost capacity the auditorium of the National Museum. *Science* has devoted more attention, and given up more of its space, than usual, during the past few months, to papers presented at the meetings of these Washington scientific societies; and some of our readers may think that we have given them undue prominence, epecially as we have not published the proceedings of scientific societies in other cities. If there are any such, we would remind them that the scientific societies of Washington are unique; they are composed almost entirely of gentlemen employed in the scientific bureaus of the government, many of them engaged in making original researches that could not be carried on by private enterprise because of their great cost. A large proportion of the papers read before the Washington societies are actual reports of progress or of the results of these investigations, and thus anticipate the official reports by months, and often by years.

ONE OF THE MOST INTERESTING features of the very creditable exhibition of the industrial work of the past year in the public schools of Washington, given last week, was what were termed the 'spontaneous' products of some of the pupils; that is, work done outside of the schools. Some of this was suggested by the teachers, and some was not, but in each case it was voluntarily performed by the pupil. One boy, ten years old, exhibited the head of an Indian, a dog, and a horse, modelled in clay, which showed much latent artistic taste and skill. Another boy, twelve years old, made a vase of clay adorned with blooming roses which he had colored. A third boy, ten years old, had modelled a cluster of roses. One of the boys in a higher grade had made an electric bell, a wire from which stretched around the hall, and was operated by means of a button in a distant part of the room. Two other boys, still in the grammar-school, had made two telephones, which were placed at opposite ends of the hall, and which worked perfectly. This 'spontaneous' work, the teachers say, is indirectly the result of the manual training recently introduced into the public schools.

VERY GREAT IMPROVEMENTS have been made in the National Museum at Washington during the last six months. Professor Goode conceives that the object of that institution should be to teach facts in regard to the resources, arts, and industries of the United States, and to a more limited extent of the world, instead of to make exhibitions to please the eye or excite the wonder of the visitor. There are many things in the National Museum that never ought to have been placed there. For instance: there is a cat upon a fence, with the query why she doesn't go over. The reason is shown in the companion object, which shows a large turtle on the tail of the cat. Probably the worst object in the museum is a deer covered with nails. It was probably once owned by some tradesman who dealt in nails, and who covered it with samples of his wares, and placed it outside his door to attract customers. How it came in the National Museum we do not know; but we do know that it ought not to remain there, and shall be surprised if Professor Goode does not soon banish it to the lumber-heap.

THE WEATHER-PREDICTIONS.

THE meteorological work of the Signal Office began in 1870, when an appropriation of $15,000 was made for it. When the weather-predictions were first published, they were looked upon with curiosity and wonder by the people, who were surprised rather that they were verified at all than that they sometimes failed. After eighteen years the weather-predictions have become a part of the every-day necessities of the people of this country. They consult them almost hourly, and by them shape their plans affecting their health, their pleasure, and their business. Instead of

$15,000 a year, the meteorological work of the Signal Office now costs $900,000, and has cost as much as $1,000,000.

In eighteen years, and with such liberal expenditures of money, this service ought to have increased, not only in the extent of its operations, as it has done enormously, but in the character of its work. With so much broader field of operations, the advancement that has been made in meteorological science, and the experience gained in eighteen years, the weather-predictions now ought to be made with much more confidence than formerly, and a larger percentage of them ought to be verified. But such improvement has not been made; at least, not to the extent that it ought to have been. The public have found this out, and, being more critical than formerly, as they have a right to be, complain when they suffer in health, comfort, or pocket through a failure of the predictions to be verified. Why is it, that, while the percentage of successful indications in 1883 was 89.1, it was in 1887 only 73.9, or, allowing for the fact that predictions are now made thirty-two hours in advance, instead of twenty-four as formerly, only 80.9?

Some, but not all, of the reasons are given in the last annual report of the chief signal officer. The indications are not now made by gentlemen who have had sufficient experience. General Greely says, "Within the past three or four years the relief of the old officers detailed from the line of the army has been forced upon the chief signal officer by legislative action. In consequence, it followed that the young officers of the signal corps, who have only within the past year or two received any extended instruction in meteorology, have been assigned to this important duty [of preparing the indications]. Within the past year three officers have necessarily been assigned to indications work who never before have performed duty of this character. It consequently follows, that, through restrictive legislation, the chief signal officer finds himself compelled to permit the new officers to serve their apprenticeship in predicting, at the expense of the whole country. It has occurred, as might be expected, that the novices in the work at times made errors that subjected the service to criticism, which, well merited in such cases, cannot be considered valid criticism of the methods followed by the service. It follows, too, that not every officer who satisfactorily performs practice indications work is well qualified for actual work. Not only is the predicting-officer weighed down with a strong sense of responsibility in the performance of this difficult and vastly important work, but he is also required to decide with as great degree of accuracy instantly, as though he had ample time at his disposal. The officer, as a rule, predicts for forty different districts, for which three elements — temperature, weather, and wind — must be determined. As the time for these predictions is strictly limited, it necessarily follows that each State or district receives less than sixty seconds' consideration at the hands of the indications officer, and each element is predicted with not over twenty seconds' consideration. Officers who have done creditable practice-work have not infrequently failed when called upon to decide instantly and officially future weather-conditions for the whole country."

And again: "The detailed records of this office show how necessary is experience for success in predicting; and it has always followed, that, after a considerable lapse of time in which no work has been done, an indications officer recommences work less successfully and with a very reduced percentage. How essential practice is to success is shown by the comparison of the work years since, when officers continued steadily on this work, with the results of late years, when changes have been frequent and the course of work necessarily broken."

Lack of proper organization of the signal corps is another cause of its failure to meet public expectation. As General Greely says, "Officers and men of the high order of ability and intelligence required by this duty cannot be expected to devote the best years of their life to a service which offers no reward in way of increased rank or pay even for the most valuable work. Poor pay and no possible advance in rank must produce unsatisfactory results. . . . Only two of the original detail remain with the corps, many having voluntarily quitted duty which promised no advancement, and some have gained promotion and reputation in other corps. . . . It is only by long study and great experience that indications officers, who perform the vital work of this service, can expect to be at all efficient in their important duties." Important as this branch of the service is, touching as it does so many vital interests of the people, Congress has always neglected to give it proper attention. In more than eighteen years no separate and distinct law affecting the Signal Service has been enacted. The only legislation regarding the corps has been in the shape of 'riders' upon appropriation bills, which, as a rule, have not had proper consideration. The law of 1866, re-organizing the army, directed the detail of six officers and one hundred men from the engineer corps. No engineer officer has ever been detailed to the signal corps. The same law provided that no officer or man should be detailed without examination and approval by a military board. This mandate has also been ignored. Under a perversion of a law of 1878, civilians have been enlisted as privates, promoted the same day to be sergeants, commissioned the next day to be second-lieutenants, and sent into the signal corps without examination of any kind, and without having served a day in the corps, to take the places of experienced men who have thus been crowded out and sent back to their regiments.

Although the Signal Service is one dealing entirely with physics, until General Greely, then a subaltern, urged the importance of it, no question bearing on the natural sciences was ever put to any sergeant examined for promotion. The result is that some of the second-lieutenants of the signal corps are officers whose mental qualifications and natural ambitions will insure their remaining in the service even under a rigid examination; while there are two other classes, one of which consists of young men, whose natural aptitudes tend rather in the direction of the line of the army than with a strictly scientific corps. The mental abilities, general education, or moral standing of the third class is such that it cannot be reasonably expected that they would ever serve with marked credit either in the line of the army or in the signal corps. General Greely has said officially that the records of the office show that the senior officer in the signal corps, next to the chief signal officer, has never been able to attain such a knowledge of the methods and work of the Signal Service as has always been exacted from every sergeant in the corps; this despite the fact that the officer in question received the most careful instruction, covering a period of nearly two years, and was thrice examined on questions which were substantially the same.

Nor has the whole story yet been told. The present secretary of war has never shown any interest in the Signal Office, and has seconded none of the efforts of the chief signal officer to improve the service. A bill, prepared by General Greely, to re-organize the corps and correct the abuses (for they are nothing less) described above, was not approved by Secretary Endicott, who seems only anxious to get rid of the bureau, and not to care how greatly demoralized it may be. The Senate in the last Congress passed a bill to transfer the Signal Office to a civil department; but it failed in the House, which already this session has incorporated in the bill creating a Department of Agriculture, which it has passed, a provision transferring this bureau to that branch of the government. In both cases it is provided that the officers now on duty in the Signal Office, with all their good qualities and defects, shall go with the service without prejudice to their commissions: in other words, although it is proposed to make the bureau a civil one, yet the officers are still given an immovable tenure of office, without discrimination being made between the worthy and the incompetent, — a perpetuation for an indefinite time of the present extravagant, inefficient, and demoralized organization of the office. Against this, General Greely protests, and asks Congress to re-organize the service whether the transfer is made or not, cut down the expense of it $100,000 or $125,000 a year, and give him a chance to make it perform its work as it should do, and as Congress has a right to expect it to. But his bill and communication receive no attention from the committee of either House. Mr. Hatch, chairman of the House committee that reported the bill which has passed that body this session, has never been to the Signal Office to learn any thing about the service, or communicated with the chief signal officer as to the needs of the service. He simply attached the provision making the transfer to the Agricultural Department bill without knowing what its effect would be. The first result of the enactment of the bill into a law will be the necessity of appropriat-

ing $65,000 additional a year to man the military telegraphs, which will then be left without an operator, instead of saving $125,000.

Is it any wonder that the weather-predictions are not always verified? General Greely, confident that the Signal Office will soon be transferred to a civil department, in loyalty to the government, began, at the opening of the present fiscal year, some preparation for it, especially by training civilians in weather-predictions, detailing one on each alternate month. Professor Abbe was performing this duty in March; and although years ago, when he had long-continued practice, he was remarkably successful, he failed to foretell the great blizzard, of which something certainly ought to have been known in advance. Similar conspicuous failures this year may be explained in the same way.

A word ought to be said about the cold-wave predictions. These are an extension of the service within the past few years, and, as a knowledge in advance of sudden great changes of temperature is of great importance on account of its bearing on the health of the people and the safety of many kinds of property, these reports, a very large percentage of which have been verified, have become very popular.

THE POLYTECHNIC INSTITUTE.[1]

EVERY middle-aged inhabitant of the British Islands must recall more than one occasion when the mind of our country has been strongly stirred on the question of national defence. The adverse evidence of an expert, a rousing article in a newspaper, has often awakened general anxiety of more or less continuance, and been followed by more or less adequate results. But it is far more difficult to awaken any widespread concern on behalf of those great abiding national interests which it is our charge and heritage to defend. And yet there are signs of no uncertainty which must to all thoughtful and instructed minds, from many directions, suggest the question whether that industrial leadership which has hitherto made our small and crowded country the world's workshop, and almost the world's mart, is not slipping from us. This is a question not of more or less wealth or luxury, but of very livelihood to the masses of the people under the special conditions of our national existence. If work ceases to come to a workshop, there is nothing for it but prompt dispersal of the workmen. All authorities seem agreed that the population of five or six millions inhabiting England and Wales in the time of Queen Elizabeth represents pretty nearly what their areas can sustain as agricultural, self-supporting countries. But the population of England and Wales alone was shown by the census of 1881 to have reached nearly twenty-six millions; so that seven years ago there was in the southern half of Great Britain an excess of twenty millions above what the country could reasonably support, except as a community of artificers and traders, and general carriers, by import and export, of the world's merchandise. It needs only a glance into past history to see that this, while an enviable position for a nation while prosperity lasts, is practical extinction when the channels of commerce are turned, or lost advantages have transferred production to new centres. Macaulay's fancy picture of the New-Zealander sketching the ruins of St. Paul's from the broken arches of London Bridge seems of very little concern to the present citizen, whose ears are deafened with the ceaseless roar and traffic of the streets. And yet precisely that doom of silence and decay has befallen many a proud mother-city of which now "even the ruins have perished." It would far exceed present limits to show in detail how many articles of our own immemorial production we ourselves now largely import, because the foreign workman produces them better, or produces them at less cost. The evidence will be fresh in the recollection of the readers of this journal. Neither can they fail to recall with what persistence we have pointed out the remedy. There is but one real remedy, — the better training of the workman, and — if we may be allowed to say it — of his employer too. Every one who, without prejudice, has opportunity to watch a fair specimen of the British workman at his work must admit that the raw material is as good as ever it was; that, in the quantity and quality of the work he can turn out in a given time, few of any nationality can equal, and none surpass him. But in the training he receives, and in the opportunities of his receiving it, there is much left to be desired. And meantime there is not only the grave fear, but in many branches of industry the accomplished fact, that other nations may and do outstrip us in the race.

Perhaps there is some belated merit in seeing that now; but all honor to those who, with heart and means to labor towards the better training of our artisans, devoted themselves to the endeavor when the need for it was less comparatively obvious. Honor especially to one man, Mr. Quintin Hogg, who, close upon a quarter of a century ago, at an age when most young men are concentrating their best energies on cricket, or foot-ball, or lawn-tennis (all good things in their way), made it his life's task to raise the skilled workman of London, and furnish him more fully for his labor, for his own sake and for ours. Probably most of our readers know how that small enterprise has become a great one indeed, with the old Polytechnic for its present home and centre, and with a fuller variety of classes and branches, and with a greater comprehensiveness of scheme, than we can now attempt to describe. But all has hitherto rested on the shoulders, and been sustained by the purse, of Mr. Hogg himself, who, during the past six years, has spent, speaking broadly, some £100,000 in establishing and sustaining these admirable schools. But the time has now come when so great a burden, for the work's sake as well as for his own, should no longer depend upon the means and life of a single man; and there is now an opportunity of securing for the institute something like an adequate endowment. The charity commissioners have offered to endow it with £2,500 per annum on condition that the public find £35,000 as a supplementary fund. £18,000 have already been promised by the personal friends of the founder; but £17,000 still remain to be raised, — a large sum, no doubt, but a small one compared to our still unrivalled resources, and the national value of the institute, not only for its own immediate results, but as a model for similar efforts in all the great centres of our industry. Those who believe in science — that is, in faithfully accurate and exact knowledge — as the only sure basis for any national prosperity that is to bear the stress of the fierce competition of our times, are earnestly invited to make themselves acquainted with the work of the institute, and to contribute to its funds. Eighty-one thousand members and students have joined since it was moved to the Polytechnic, 309 Regent Street, in 1882. All donations or subscriptions will be thankfully received there, or by Mr. Quintin Hogg, 3 Cavendish Square, W.

[1] From *Nature* of May 24, 1888.

SCIENTIFIC NEWS IN WASHINGTON.

Tricks of Indian Jugglery. — The May Fogs on the Atlantic.

Indian Jugglery.

THE feature of the evening at one of the late meetings of the Anthropological Society was a paper by Col. Garrick Mallory on 'Algonkin Glyphs on Bark and Stone.' The paper also dealt briefly with some related subjects, and will form a part of the annual report of the Bureau of Ethnology. The following is a brief chapter on 'Indian Jugglery,' extracted from this paper: —

"Paul Beaulieu, an Ojibwa of mixed blood, present interpreter at White Earth Agency, gave me his experience with a Jossakeed, at Leech Lake, about the year 1858. The reports of wonderful performances reached the agency, and, as Beaulieu had no faith in the jugglers, he offered to wager one hundred dollars, a large sum, then and there, against goods of equal value, that the juggler could not perform satisfactorily one of the tricks of his repertoire to be selected by him (Beaulieu) in the presence of himself and a committee consisting of his friends.

"The wager was accepted, with the result to be described.

"A medicine lodge was made. Four strong poles were planted deep in the ground, rising to an elevation of at least ten or twelve feet; one of them having the branches remaining and rising a little beyond its fellows, this being the indication of a Jossakeed as distinguished from a Medé lodge. The interior diameter was less than four feet. The frame, which was inclined to the centre, was then filled in with intertwined twigs, and covered with blankets and birch-bark from the ground to the top, leaving an orifice of about a foot in diameter open for the ingress and egress of spirits and of the objects to be mentioned, but not large enough for the passage of a man's body.