of Baku yield more than all the others combined. But we may fairly set all of them—the entire Eastern Continent—aside as being of no great moment. It is no mere figure of speech, it is not rank boasting, to say that petroleum, so far as the markets of the world are concerned, is an *American product*. Our regular daily and monthly yield so far surpasses all others that they cannot be counted as rivals in the trade and its results.

The springs of Baku yield about 500,000 barrels annually; we turn out that amount in the space of a very few weeks at any time. The records of 1879, not to speak of anything later, give the exports only from the three ports of Philadelphia, Baltimore, and New York at 8,500,000 barrels. Surely we may call petroleum, in all its bearings, an American product.

And does it come from all parts of America? Perhaps few persons are aware how very much restricted really is the region which yields such incredible results. The fact is that the "oil center," that from which petroleum has been produced in paying quantities, can all be comprised within a space 39½ *square miles*. It is wonderful. We will look to it again.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY H. C. HOVEY.

The attendance on the thirty-second annual meeting of this influential organization was less than for several years past. This was mainly owing to its being held in a locality so far to the West, and to the refusal of some of the main trunk-lines to reduce railroad rates. Yet there were from 300 to 400 scientific people convened at Minneapolis from all parts of the country, and although the hospitality of this thriving and beautiful city is ample, the probability is that it was sufficiently taxed. The majority of members present was from the Western States, while barely a hundred were from the East. The daily sessions, from Aug 15 to 22, were held in the admirably located buildings of the State University, near the Falls of St. Anthony. The opening prayer was by Bishop Foss, after which addresses of welcome were made by Mr. G. A. Pillsbury, chairman of the local committee, Gov. Hubbard, Mayor Ames, and Pres. Folwell, of the University, men who had seen Minneapolis grow from a cluster of huts amid wolves and Indians to be a city of 100,000 inhabitants. Surely the representatives of such a place were pardonable for a little boasting as they indicated its vast resources, and pointed to its proofs of tireless energy. To these words of welcome Prof. C. A. Young, the President of the Association, responded; after which Prof. F. W. Putnam made his report as Secretary, and read the list of members who have died during the year—15 in all.

The sections were then organized, and heard addresses from the Vice-Presidents. Prof. W. A. Rogers spoke, in Section A, on "The German Survey of the Northern Heavens." Previous to this work, undertaken by the German Astronomical Society, formed in 1866, stellar catalogues abounded in errors, and no attempt had been made to get at a homogeneous system. This society has undertaken to determine the co ordinates of all stars in the northern heavens down to the ninth degree of magnitude. Special interest attaches to the work, both on account of its practically useful results and also its bearing on the principles underlying the form and stability of the stellar and solar systems.

In taking the chair in Section B—Physics—Prof. H. A. Rowland made an able plea for "Pure Science." Before any science can be applied it must exist. In America we are mainly applying what we borrow from countries where pure science is cultivated. Our colleges are too many, and too poorly equipped. Over 100 institutions in this country are called universities. The term should not be applied to anything having an endowment of less than $1,000,000. He attacked in severe language the little colleges with incompetent professors. There were in this country, in 1880, about 400 colleges with a total wealth of $40,000,000 in buildings and $43,000,000 in funds. He would, if possible, concentrate this into one great university with $10,000,000, four minor ones of $5,000,000 each, and 26 colleges of $2,000,000 each. Then the interests of pure science could be properly cared for.

Prof. Otis T. Mason addressed the Anthropological Section on the nature and value of anthropological studies, which he defined as an attempt to apply to the inductive study of man the methods approved in the general study of natural history. Patient investigation should be made into the whole series of problems arising as to the human race; its ethnology, glossology, technology, psychology, sociology, mythology, and hexiology, or balancing of harmony with the outer world. Men should study man. Science has her mission field as well as religion.

The opening address in the section of Biology was by Prof. W. J. Beal, who chose to speak on the scientific needs of agriculture. No industry excels this in importance, yet none is more at the mercy of caprice. It should be protected against the whims of politicians. He spoke of the value of chemistry, entomology, meteorology, and other sciences in their application to agriculture.

The "Methods of Statistics" were treated fully and admirably by Dr. F. B. Hough, in opening the newly constituted section on Economic Science. The collection and classification of data demand simplicity, accuracy, and completeness, and on this thoroughness depends the success of both public and private enterprises. Loss and failure flow from ignorance or inattention to facts. Our common interests may be promoted by associations for gathering statistics. This stimulates inquiry and activity in business of all kinds, and furnishes a sound guarantee for all sorts of human undertakings, whether commercial, political, religious, or educational, and tends to check speculation and fraud. Official statistics may be classified as being: (1.) Summaries of current business published annually. (2.) Periodical inquiries at wider intervals, like the census taken every decade. (3.) Special inquiries by experts or commissions created for the purpose. The speaker then gave a historical sketch of census taking from colonial times to the present day. Great difficulties yet remain, the chief ones being in getting at facts with certainty, recording them accurately, and condensing the mass of materials into a useful and accessible form. Estimates will depend on the intelligence and honesty of him who makes them. The speaker dwelt at some length on the use of what he termed "graphic illustrations," *i.e.*, devices by means of lines, areas, and colors to represent quantity, time, direction, and intensity of force. Their skillful use will greatly facilitate comparison of subjects and the study of the relation of causes and effects.

The opening address on "Geology and Geography" was by Prof. C. H. Hitchcock, who showed that these sciences were associated and interdependent. The very zones of the earth must have been arranged according to the varying density of a cooling globe. The primeval ocean came from condensed vapors assuming liquidity as soon as water could remain upon the solid crust of what had been an igneous sphere. Through such a crust numerous volcanoes, discharging melted rock, would build up hills overlooking the water and forming the dry land—continents would arise inclosing land-locked valleys and wide areas of fresh water. Some of these immense basins would be filled by the action of various forces, until the resulting plains would be capable of sustaining the varied forms of organic life. Glacial action put on the finishing touches of the earth's contour, and the completed structure must be pronounced "very good."

The sections having been duly organized and opened, the retiring president, Dr. J. W. Dawson, of Montreal, addressed the assembled body at Westminster Church on "Some Undiscovered Truths of Geology." It abounded in interesting thoughts, of which but an epitome can be given. His subject covered the whole history of the earth in all time, allying itself at the beginning with astronomy, physics, and celestial chemistry; and dealing along its course with meteorology, geography, and biology, and finally getting mixed with questions of archæology and anthropology.

In such a wide sweep we need not be surprised to learn that there are yet some unsolved problems. We are met at the outset with an inquiry as to man's place in the nature he is to study. His organism is certainly a part of nature, and he is the terminal link of a long chain of being. As a scientific animal, man finds within himself a mind more potent than matter, and that reacts on nature. We recognize this difficulty when we divide science into experimental and observational. It does little good to meet mysteries by guesses, nor should we on the other hand resign ourselves to ignorance. We must wrestle with the unsolved questions of nature, mastering what we can and leaving others to be grappled with by our successors. In proceeding to mark out the limits of ascertained knowledge, the speaker began with the oldest rocks, a formation of immense thickness, and corresponding to what used to be called fundamental granite. He intimated his belief that this was deposited as gneiss from a shoreless ocean. The Lower Laurentian rocks probably limit our progress backward, beyond which lie only physical hypotheses as to a cooling incandescent globe. Ascending, we meet with significant changes. Beds of limestone are associated with the beds of gneiss. Gravel beds show the existence of shores; and graphite informs us of some sort of plant life, and iron ores of organic matters. In the Middle Laurentian appeared the *Eozoon Canadense*, probably the oldest form of life of which we have any knowledge. Metamorphism next came into play. Nothing in geology perishes. Heat may change clays into slates, and limestones into marbles; but nothing wholly disappears. A great battle rages over the genealogy of the rocks, the steps of which Dr. Dawson set forth, claiming that the sudden incoming of life in varied forms baffled biologists and furnished an unsolved problem. The theories of evolution are insufficient to account for it. The process still is as mysterious as ever, and a great gap is left in our accumulated knowledge.

Suppose that we start, however, with a number of organisms ready made; we ask, how can these have varied so as to give us new species? It is a singular illusion that variation may be boundless, aimless, and fortuitous, and that development arises from spontaneous selection. Varieties must have causes, and the vast and orderly succession of nature must be regulated by fixed laws, only a few of which are yet known to us. One consideration showing how imperfect are our attempts to reach the true causes of genera and species, is the remarkable fixity of leading types. Trace certain forms of life along their own line through stupendous vicissitudes and across the ages, and you find them substantially unchanged. Examples are the foliage and fructification of mosses, the venation of wings of insects, the structure and form of snails; all of which were settled in the Carboniferous age. Huxley holds that there are but two possible alternatives as to the origin of species, viz., 1. Mechanical construction, 2. Evolution. But we know that instead of two there are numerous possible methods, such as absolute creation, mediate creation, critical evolution, and gradual evolution. The origin of whales affords an example of the difficulties arising from referring existing forms to imaginary ancestors. Gaudry, though a strong evolutionist, candidly says, "We have questioned these strange and gigantic sovereigns of the Tertiary oceans, and they leave us without a reply."

The periods of rapid introduction of new forms of life were not periods of struggle for existence, but of expansion; while the real periods of struggle were marked by depauperation and extinction.

Another unsolved problem is the inability of palæontology to fill the gaps in the chain of being. Many lines of being present a continuous chain. On the other hand, the abrupt and simultaneous appearance of new types in many specific and generic forms, over wide areas, obliges evolutionists to assume periods of exceptional activity alternating with stagnation—a doctrine scarcely differing from the old theory of special creation. Plainly a vast amount of conscientious work is needed to account for these breaks in the chain.

Another mystery yet unexplained is the cause of the great movements of the earth's crust by which mountains and plains and ocean beds have been formed. It is known, however, that much is due to the unequal settling of the earth toward its center, and also to the pressure of the ocean against the shore. Complex movements of plication are more easily comprehended than the regular pulsations of flat continental areas, each change being accompanied by changes of climate, plants, and animals.

The problems as to coal formations, the ancient fucoids or algæ, and as to the great and much debated glacial period, next received attention. What caused the great climatic changes that have occurred during geologic time? How came there to be a vast continental glacier reaching as far south as the 40th degree of latitude and thousands of feet thick? Shall we not after all have to give up this favorite theory? May not many of the phenomena be explained by supposing a glacial sea with Arctic currents and icebergs wafted southward or due to local glaciers? It may also be questioned if glaciers are not relatively protective rather than erosive agencies, and if sufficient importance has been attached to their work in leveling and filling old bills and channels. Still another question is as to how long a time has elapsed since the glacial era. Recently the opinion has been gaining ground that its cessation dates back only 6,000 or 7,000 years. This problem, of course, carries with it the question of the origin and early history of man.

The practical inference is that we are but new-comers on this earth, and have had but little time to solve such great problems. Geology is young, scarcely a century old. We are surprised that so many regard it as a complete and full grown science. Humility, hard work, and abstinence from hasty generalizations should characterize geologists for at least a few generations to come. Science is light, and light is good. Let us raise it high enough to shine over every obstruction that casts any shadow on the true interests of humanity. Above all, let us hold up the light and not stand in it ourselves.

Copper in the Pickle Jar.

The Court of Appeal in Brussels has just decided that the objection to pickles, artificially colored green by the contact of the vinegar with copper utensils, is a mere prejudice. Some manufacturers of pickled gherkins in that city having been condemned in December last to a fine, for having in the technical language of the judgment "sold or exposed for sale certain substances affected by copper verdigris, of a nature to cause the death of the consumer, or at least to produce effects injurious to health," one of the condemned appealed, and the case has necessitated the examination of scientific witnesses, and the hearing of arguments from eminent counsel on both sides.

On the part of the prosecution, M. Depaire, ex-Professor of Chemistry in the University of Brussels, deposed that salts of copper are unquestionably poisons. For the appellants, however, M. Dumoulin, Professor of Chemistry in the University at Ghent, declared with no less confidence that such salts are "incapable of doing any harm." This witness even stated that so certain was he on this point, he himself, as well as his wife and children, had taken a strong dose; that so far from being unwell they had felt better for the experiment. M. Dumoulin's emphatic assertion that the "sels de cuivre" "had been calumniated by science" is stated to have caused a strong sensation among the parties interested in court. Finally judgment, free of costs, was given for the appellant.—*London Daily News.*

Flowers Colored by Absorption.

At a late social entertainment the Prince of Wales is said to have carried a bouquet of large lilies tinted with delicate pink and blue, by the absorption of dyes through the stems. The dyes do not in the least affect the perfume or freshness of the flowers. The process is the discovery of Mr. Nesbit. It is said flowers refuse to absorb certain colors. Some of the lilies which had been treated with a purple dye separated the red and the blue, the colors being divided in the process of absorption.

Staining Cherry in Imitation of Old Mahogany.

Digest logwood chips in vinegar or acetic acid for twenty-four hours or more. When ready to use, heat the solution, then dip the wood until the suitable color is obtained.

The Nickel Plate Patent.

The decision of the United States Court for this district, Judge Blatchford presiding, sustains once more, goes a little further, and gives a still broader interpretation to the Adams patent than had been given at any previous trial. Judge Blatchford holds substantially that Adams was the first discoverer of a practical method for electroplating with nickel, and his patent secures to him practically a broad monopoly of the art, and of all articles electroplated with nickel. The patent in question was granted to Isaac Adams, Jr., August 3, 1869, and the two principal claims read as follows:

1. The electro deposition of nickel by means of a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction.

4. The electroplating of metals with a coating of compact, coherent, tenacious, flexible nickel of sufficient thickness to protect the metal upon which the deposit is made from the action of corrosive agents with which the article may be brought in contact.

The defendant, Pendleton, obtained a patent September 28, 1880, for what he claims as a new and entirely different mode of plating with nickel. His claims are as follows:

1. In the art of nickel plating, an acid solution of acetate of nickel, consisting of oxide of nickel and acetic acid, said solution having an excess of acid.

2. The method of making acid solutions of acetate of nickel, consisting in slowly digesting oxide of nickel and acetic acid with or without heat, so as to have an excess of acid in the solution, substantially as described.

The court held the Pendleton process to be merely the chemical equivalent of the Adams process, and accordingly gave judgment for Adams, with injunction and an account. How the Supreme Court will look upon the matter remains to be ascertained.

An Important Electrical Trial.

The patent suit brought by the owners of the Gramme dynamo-electrical machine, to establish their claims to a broad monopoly in the manufacture of these instruments, has at last been brought to final argument before the United States Circuit Court at Newport, R. I. If the patent is sustained it is supposed that nearly all of the dynamo machines now running will be found to be an infringement—in which case the Gramme owners will make a rich haul. One of the most serious points made against the Gramme patent is that it was patented in Austria prior to the grant of the American patent, which Austrian patent has expired. Under the American law the American patent ceases with the expiration of the previously granted foreign patent for the same inventor; and if this patent has been clearly proven the decision must necessarily be adverse to the validity of the Gramme invention. It is expected that several weeks will elapse before the judgment of the court will be delivered.

NEW BORING MACHINE.

The engraving shows a very simple appliance for boring holes in wagon fellies, either radially or at any desired angle.

IMPROVED BORING MACHINE.

The frame which clamps on the felly carries an arm, having at the end a socket, in which is placed an eye that is adjustable up or down, and is clamped in any desired position by means of the set screw.

In this eye is placed a shaft having at one end a crank by which it may be turned, and at the other end a square socket adapted to the shanks of boring bits. It will be seen that by raising or lowering the eye that carries the bit shaft, the angle of the hole bored by the bit may be varied, and by clamping the device in different positions on the work to be bored, the holes may be made at any desired angle laterally.

This machine has been patented by Mr. Vincent Cox, of New Vienna, Ohio.

VELOCIPEDE SLEIGH.

The engraving shows an improved velocipede sleigh recently patented by Mr. James B. Bray, of Waverly, N. Y. The apparatus is to be ridden and propelled in a manner similar to that of the velocipede or bicycle. The backbone is supported by two pairs of runners, the front pair being swiveled. The propelling wheel is mounted in a forked frame swiveled in the backbone or main frame, and provided with spurs projecting from its periphery.

BRAY'S VELOCIPEDE SLEIGH.

The outer ends of the crank shaft are connected with the front runners, so that when the wheel is turned for steering, the front runners will turn in the same direction.

This velocipede sleigh is designed to secure a high speed on snow or ice.

Relief of Sea Sickness.

In spite of the fact that much has been written on the subject, people still continue to suffer from sea sickness, which proves the unreliability of our therapeutic resources. Therefore the following experience of Dr. T. M. Kendall, who has recently had 200 cases under his charge, may prove interesting:

Many people, as soon as sea sickness commences, have recourse to oranges, lemons, etc. Now oranges are very much to be avoided on account of their bilious tendency, and even the juice of a lemon should only be allowed in cases of extreme nausea.

Champagne, too, is a very common remedy, and, without doubt, in many cases does good; but this appears to be chiefly due to its exhilarating effects, as, if it be discontinued, the result is bad, and a great amount of prostration follows.

Creosote is a very old but still very good remedy, and, in cases accompanied by great prostration, is very useful; but if given in the early stages of sea sickness, it is often followed by very bad results, and even increases the nausea.

Bicarbonate of soda is useful in slight cases, as it relieves nausea, and checks the frequent eructations which often follow attacks of sea sickness; but, in severe cases, it is absolutely useless, and, in fact, it very often prolongs the retching.

A very good remedy in the earlier stages of sea sickness is a teaspoonful of *Worcester sauce*. How this acts I cannot say; but it, without doubt, relieves the symptoms, and renders the patient easier. Its action is probably of a stimulant nature.

Hydrocyanic acid is of very little service, and most acid mixtures are to be avoided, except that perhaps, for drinking purposes, when it is best to acidulate the water with a small quantity of hydrochloric acid.

Of all the drugs used, I found the most effectual was *bromide of sodium*. When bromide of sodium is given in doses of ten grains three times a day, the attacks entirely subside, the appetite improves, and the patient is able to walk about with comfort.

In all cases of sea sickness, it is very desirable that the patient should take sufficient food, so that at all times the stomach may be comfortably full, for by this means overstraining during fits of retching is prevented, and the amount of nausea diminished. The practice of taking small pieces of dry biscuit is not of much use; as, although the biscuit is retained by the stomach, yet the amount taken is never sufficient to comfortably fill the stomach. Soups, milk puddings, and sweets are to be avoided, as they increase the desire to be sick, and are followed by sickening eructations. Fat bacon is easily borne, and does much good, if only the patient can conquer his aversion to it. When taken in moderate quantity, it acts like a charm, and is followed by very good results.

But of all food, *curry* is the most useful in sea sickness, and is retained by the stomach when all other food has been rejected. Next to curry, I would place small sandwiches of cold beef, as they look nice on the plate, and are usually retained by the stomach.

In conclusion, I would advise that brandy should be used very sparingly, as, in many cases, it induces sea sickness; and its chief use is confined to those cases where the prostration is very great, and even then champagne is more effectual.

Penny Kites.

Some things made in New York are very dear—models for the Patent Office, for example, and good lamb chops, but some other things are excessively cheap—for instance, kites, which can be had for a cent a piece.

"The penny kite," said a dealer to a *Sun* reporter, "is a simple affair, but those unfamiliar with the business think it a marvel of cheapness. They are all alike in size and shape, but differ in color. The kite consists of a piece of paper and three slender sticks. The piece of paper is from one-eighth to one-sixth of a full sheet, a ream of which will weigh forty pounds. The paper costs seven cents a pound, so the piece for a kite costs about one-sixteenth of a cent. A foot of pine will make sticks for sixty kites. At the market rate for lumber they will cost about as much as the paper or a little more. The materials of the kite thus cost about one-eighth of a cent. Sometimes the paper is printed with a picture of a horse or a yacht, or some other fancy cut. This adds twenty-five cents a thousand to the cost, but gives a variety for the boys to choose from.

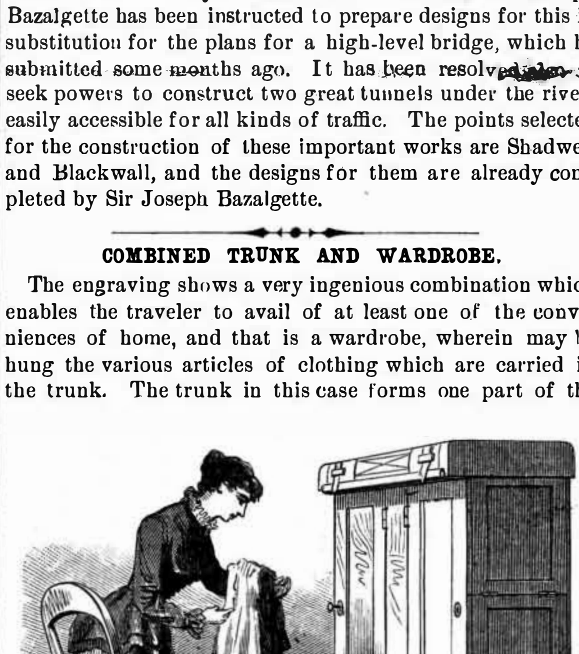
"The paper, cut to the right size, is piled on a table on one side of a girl. Two piles of sticks are at her other hand, and a pot of paste and a brush before her. She spreads out a piece of the paper, and runs the paste brush around the edge. Then two of the longer sticks are laid on in the form of an X. Across the cross of the X a shorter one is laid. Then the pasted edges of the paper are folded over, inclosing the ends of the sticks. The completed kite is laid away to dry. Cost for labor, one-sixteenth of a cent. Cost of the kite, three-sixteenths of a cent. Some cost as high as three-fifths of a cent, but they sell no better than the others. There is a fair margin of profit all around."

Two New Tunnels and One Bridge.

The London Metropolitan Board of Works has unanimously determined to ask the sanction of the House of Commons for the construction of a low-level bridge across the Thames immediately eastward of the Tower. Sir Joseph Bazalgette has been instructed to prepare designs for this in substitution for the plans for a high-level bridge, which he submitted some months ago. It has been resolved also to seek powers to construct two great tunnels under the river, easily accessible for all kinds of traffic. The points selected for the construction of these important works are Shadwell and Blackwall, and the designs for them are already completed by Sir Joseph Bazalgette.

COMBINED TRUNK AND WARDROBE.

The engraving shows a very ingenious combination which enables the traveler to avail of at least one of the conveniences of home, and that is a wardrobe, wherein may be hung the various articles of clothing which are carried in the trunk. The trunk in this case forms one part of the



COMBINED TRUNK AND WARDROBE.

wardrobe, and incloses the other parts, which may be easily and quickly put into position to form a wardrobe. Most of the parts required in addition to the trunk itself to form the wardrobe are carried in the trunk cover, as shown in the sectional view. The boards, A B, forming the sides and back of the wardrobe, are compactly folded together in the trunk cover, and the doors, C, are packed with the clothing in the body of the trunk.

Hooks on which the clothing is to be hung are hinged in recesses in the back, and when the wardrobe has been formed they are swung out for use. The doors are provided with locks, so that the wardrobe is in every way as complete, secure, and convenient as those of the usual pattern.

This invention has been patented by Mr. Alphons Dryfoos, of New York city.