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Contents.

(Illustrated articles are marked with an asterisk.)

WORK FOR ARCTIC EXPLORERS.

The scientific work, laid out for the arctic exploring expedition which lately sailed from England, probably excelled in scope and variety that of any preceeding expedition as remarkably as its material outfit did. The instructions for the guidance of the observers were prepared by the most eminent Englishmen in the several departments of research, and are minute and comprehensive enough to keep the explorers from idleness, whatever else may befall them.

Popularly the grand object of the expedition is to reach the pole; practically that is one of the least important of the many purposes of the voyage. And a couple of years spent in arctic regions can scarcely fail to be fruitful scientifically, even if the pole still remains unwon. There is much to be learned of the natural history of those frigid regions, and many physical phenomena await solution there. Chief of the latter may be regarded the magnetic condition of that portion of our globe.

Accustomed to the near coincidence of compass north with astronomical north in this part of the world, it is all but impossible for us to form any adequate conception of the magnetic confusion that the explorer has to deal with in arctic regions, when compass north is no longer toward the pole but toward an area west of Baffin's Bay, in north latitude 70°,—the magnetic pole. This point will lie to the astronomical southwest of the expedition when it reaches Smith's Sound, where the Alert hopes to go into winter quarters; in other words, astronomical southwest will there be identical with compass north, and the north pole will lie to the southeast by compass.

As a guide to the expedition, three provisional maps have been constructed, showing, for the whole unexplored area, the magnetic condition which may be expected if the distribution of terrestrial magnetism be such as our present knowledge indicates. The most important of these maps of the magnetic elements shows the assumed lines of compass direction over the whole circumpolar area, and the region of Greenland, Baffin's Bay, and Davis' Strait, and also, approximately, the lines of equal declination between the north pole of the earth and the northern magnetic pole over the same areas. The importance of such information to the explorers is shown by the following example:

Suppose the expedition to have arrived at the parallel of 85° in longitude 60° W. of Greenwich, at which point the pole will be due east by compass. They start in an astronomically easterly direction for a sledge journey along the parallel of 85°. In longitude 20° W. of Greenwich the north pole will bear northeast. When longitude 40° E. of Greenwich is reached, the astronomical and magnetic meridian will correspond; the north pole will lie between the explorers and the magnetic pole, and the compass will therefore point to the true north. In longitude 180° the pole will bear due west; and in longitude 112° W. of Greenwich, the explorers will have arrived between the north pole and the magnetic pole, and consequently the north pole will bear due south.

Should the expedition be so lucky as to reach the pole, all the points of the compass will be south; latitude and longitude will vanish; the north star will lie directly over head, and all the other stars will revolve around it, neither rising nor setting. The moon will remain for days above the horizon, and the sun, in summer time, will make an unbroken circuit of the heavens, yet always in the south. Time in its ordinary sense will cease; morning, noon, and night will be one; the dial of the heavens will be a blank.

The astronomical instructions prepared by Mr. Hind, superintendent of the "Nautical Almanac," give data for two eclipses of the sun in the polar area in 1876 and 1877; also a list of occultations of stars by the moon visible in or near the probable winter quarters of the expedition, 82° N. latitude and 60° W. longitude, between September 1875 and March 1877, which will enable the observers to employ the best means of determining their longitude.

Special arrangements have been made for the spectroscopic study of the aurora, the instructions for which were prepared by Professor Stokes.

Professor Tyndall furnishes hints for the observation of glacial phenomena; the rapidity of the conduction of heat through ice; the rate at which the ends of glaciers advance into the sea; whether icebergs are formed by the buoyancy of the masses of ice thrust under the water, or by the weight of overhanging ice cliffs whose bases have been worn away by the waves; what kinds of matter are brought down from the interior by glaciers and transported by icebergs; the condition of rocks and hills along the sides of glaciers; the color of the ice and its veining at the ends of glaciers; also the color of the sky, the presence or absence of germs in the air, the range of sounds, and so on.

The solution of many weather problems will be looked for through continuous meterological observations, especially with regard to storms which pass over the extreme northern part of Europe, many of them being connected with areas of barometrical depression which follow tracts lying within the arctic circle.

Especial attention will also be given to tidal phenomena, particularly of the tidal wave which sets southerly through the northern part of Smith's Sound, and indicates an open passage along the northern coast of Greenland. Pendulum observations will also be made, with a view to obtaining *data* toward the determination of the earth's figure in high northern latitudes.

The natural history of the region explored will be attended to with equal care. The instructions for biological and botanical observations were furnished by Professor Huxley and Dr. Hooker. The latter particularly refers to the deficiency of our knowledge respecting the hybridizing of certain of the species of arctic plants, especially those of *draba, saxifraga*, and *salix*. He suggests also that the pollen of the various species should be carefully examined, and observations made as to whether it is carried by wind or by insects, and gives minute directions for observations touching the power of seeds to resist cold without loss of life. In this connection it may be remarked that not more than 762 species of flowering plants have been found in arctic regions, the number belonging exclusively thereto being about fifty. Arctic Greenland furnishes 207 species, of which 195 are Scandinavian types, while only 12 are American and Asiatic types. Botanically, therefore, Greenland is much nearer to Europe than to America. Among the four plants collected by Dr. Bessell, of the Polaris, in latitude 82° N.—the extreme northern limit of phanerogamic vegetation, so far as known—was a near relative of our familiar dandelion.

With microscopic plants and animals the arctic seas are abundantly furnished, and Professor Huxley directs especial attention to them in connection with the composition of the sea bottom for the testing of certain modern palæontological theories. Instructions for the collection and preservation of such low forms of life were furnished by Dr. Allman, who also directs attention to the phosphorescence of the sea, as far as it is due to living organisms.

The explorers are also furnished with descriptive lists of the mammalia which may be seen, with directions for observation and the preservation of specimens; also with instructions with reference to the collection of geological and mineralogical specimens, meteorites, meteoric dust, and other matters of interest.

INSTABILITY OF THE EARTH'S SURFACE.

We are so accustomed to consider the solid earth to be the type of perfect stability that it requires quite an effort of the mind to elevate itself to the thought that even the rocks, which appear to be the foundation on which everything else rests, are of an unstable nature, subject to upheavals, depressions, and dislocations. Every observing mind that has seen bold mountain regions, railroad cuttings, or mining shafts must have been struck with the evidences of mighty disturbances, although perhaps a book on geology never came under his eye. It is the study of these disturbances which has created this science, one of the most interesting in the whole field of human knowledge

It was formerly supposed that the only cause of such changes was volcanic action, and that all the metamorphoses which have taken place were sudden and violent. The observations of volcanic action and of the changes which it rapidly produces in the earth's surface necessarily led to such conclusions; but patient investigation, during long periods of time, has led to the knowledge of a mode of change, formerly unsuspected, by slow upheavals and depressions, taking place gradually, at a rate of one or more feet in a century. Such changes have been and are now constantly taking place, and necessarily must, if prolonged for a sufficiently long period of time, essentially change the earth's surface, not only as to the relative hights of continents and islands, but, in connection with the ocean, as to the whole cosmography of our globe.

We will not speak of the supposed continent Atlantis, mentioned by the ancient mythological writers, which was, they asserted, sunken in the Atlantic ocean; but we will only mention positive facts, recorded as a result of careful observation. That the coasts and bottom of the Baltic sea are rising is an old and well established fact, the ancient shores being several thousand feet from the present water's edge; while Great Britain and part of the west coast of Europe, Holland, Belgium, and France are in a sinking condition. The evidences in and around the British Channel have long since proved the probability of this, while the Astronomer Royal has announced that minute observations prove that Greenwich Observatory, with the ground upon which it stands, has been sinking ever since its establishment.

In regard to our continent, it has been proved that the whole Pacific coast, especially California, with all its mountains, is perpetually rising, and that at a comparatively rapid rate. The land containing in its bosom our great American Lakes is slowly sinking; while southern Indiana, Kentucky, and the surrounding States are rising. Geological investigations prove that our great lakes, except Ontario, had formerly a southern outlet; until, by gradual northern depressions and southern upheavals, a northern outlet was formed from Lake Erie into Ontario, about 40,000 years ago. This outlet, the Niagara river, is still wearing away its channel. The division line, of the watershed south of the lakes and the Mississippi valley, has since that time been steadily traveling southward; and when Chicago recently turned the waters of Lake Michigan, through the Chicago river, into the Mississippi valley, the old state of affairs was artificially re-established.

New Jersey is sinking, with New York city and Long Island, at the estimated rate of about 16 inches per century. The coast of Texas is ascending at a comparatively very rapid rate, some observers stating that it is as much as 30 or 40 feet in the last half century.

Combining these observations with the results of the recent deep soundings of the United States steamer Tuscarora in the Pacific Ocean, we find that the bed is evidently a sunken continent, abounding in volcanic mountains some 12,000 feet high, many of them not reaching the surface of the ocean, and others which do so forming the numberless islands of the Pacific. The study of the coral rocks proves that this sinking has continually been taking place during several centuries, and observations of the coast will undoubtedly reveal the fact that it has not yet ceased.

The most eminent German geologists and ethnologists now maintain that the locality of man's primitive origin, the seat of the so-called Paradise, was in the Pacific Ocean south of Asia, whence the race slowly diffused itself northward to Asia, westward to Africa, and eastward to Australia. When the great Pacific continent slowly sank, so that the ocean commenced filling the valleys, man retreated to the mountains, which, by continued sinking, were transformed into islands, and now form the many groups of Polynesia. The insularity of the thus preserved races was not productive of civilization, which requires conflict, in which the superiors in the end gain the victory over the inferiors. In those islands, the inferior races were preserved for want of this conflict, hence their savage condition even at the present day; while primitively the greatest advance took place at the spot of the most intense conflict, the continent of Southern Asia. Even at the present day, it has been said that gunpowder is the greatest civilizer.

THE COLORADO POTATO BUG.

The farmers in our vicinity are just now having their potato fields invaded by the celebrated Colorado bug, and the demand for Paris green has become so great throughout the country that, were it not an article obtainable in almost unlimited quantities, the price would be greatly enhanced.

Let every user of the article keep constantly in mind that Paris green is a deadly poison, and great care should be taken in the handling of it. Hands from which the skin is abraded, or on which any sore exists, should be protected with gloves, and all precautions should be used against inhaling the poison while mixing it.

The following, from the *Maryland Farmer*, seems to be a practical mode of applying the poison to the vines. We would, however, suggest, that, on small patches, the dipping of a broom in the liquid and shaking it over the vines be used as a substitute for the appliance which our contemporary suggests:

THE COLORADO BEETLE—THE BEST EXTERMINATOR.

Sweeten a barrel of water with 1 gallon of cheap molasses; then add and well incorporate 1 lb. good Paris green, and apply the same in one application to 1 acre of potatoes. The best mode of applying the liquid to the potato vines is in the use of a can that will contain 4 or 5 gallons, which may be lashed on the back of a man, who may apply the liquid, very uniformly and rapidly, by having two short pieces of ¾ inch india rubber hose attached to the bottom of the can, the other end of the hose terminating in a tin rose, similar to that on watering pots. The liquid should be well stirred at each filling of the can, and it should be frequently and violently shaken during the time of applying it. An active man can apply the poison to four acres of potatoes in a day with ease, and two applications, at proper intervals, will save the crop.

The cost is estimated as follows: Hauling water, mixing, and applying the liquid, 30 cents per lb., two applications, 60 cents; 2 gallons molasses, 60 cents; 2 lbs. Paris green, $1.40; total, $2.60.

THE POWER OF SMALL ENGINES.

One of the most frequently recurring questions, asked by our correspondents, relates to the power that can be obtained from an engine of given dimensions, with a specified steam pressure and number of revolutions per minute. As we have frequently explained, questions of this sort can only be determined definitely by means of tests. The rules, ordinarily found in works on the steam engine, for calculating the horse power of an engine, give results that rarely accord with those obtained in practice. Indeed, it is impossible to lay down rules that will apply to all cases, the construction and performance of different engines being so varied. We feel, however, that we must do something to satisfy the many readers who want information about the small engines which they are building or using. We have therefore compiled a table, from the best data at our own command, by which the performance of small engines of good design can be approximately estimated. We have also added some examples to illustrate the use of the table. It is designed for engines with cylinders up 6 inches in diameter, and for piston speeds up to 400 feet a minute: the connection of the engine with the boiler being supposed to be tolerably direct, the ports and pipes being of sufficient size, and the steam valve closing when the piston has made ¾ of the stroke. Even with all these suppositions, which probably represent the average conditions of small engines, the table will give results that are too large in some cases and too small in others, for the very reason that it does represent average conditions. With these explanations, we will proceed to illustrate its use.

1. To find the area of a piston, knowing its diameter: Multiply the square of the diameter by 0·7854. Example: The diameter of a piston is 3 inches. What is its area? The square of 3 is 9. Multipying 9 by 0·7854, we obtain 7·0686, as the area of the piston in square inches. It may be well to observe that, whether the piston has either a flat, rounded, or raised end, its effective area is to be calculated from the diameter, as explained above.

2. To find the speed of a piston in feet per minute, when the length of stroke and the number of revolutions per minute are known: Multiply twice the length of stroke, in inches, by the number of revolutions per minute, and divide by 12. Example: An engine has a stroke of 3 inches, and makes 300 revolutions a minute. What is the piston speed? Twice the length of stroke is 6 inches. Multiplying by 300, and dividing by 12, we obtain 150, as the piston speed in feet per minute.

3. To find the horse power of an engine, when the diameter of the cylinder, the length of stroke, the number of revolutions per minute, and the pressure of steam in the boiler are known: Find the area of the piston, in square inches, and the piston speed, in feet per minute. Find the number in the table, the nearest to the given steam pressure and calculated piston speed, and multiply it by the area of the piston. Example: An engine has a cylinder 2 inches in diameter and with a length of stroke of 2 inches. It makes 400 revolutions a minute, with a boiler pressure of 50 lbs. per square inch. What is the horse power? Square of diameter of piston 4 × 0·7854 = 3·1416, area of piston, in square inches. Twice the length of stroke 4 × 400 = 1600 ÷ 12 = 133⅓, speed of piston in feet per minute. Nearest piston speed in table is 130, and the number in table corresponding to piston speed of 100 feet per minute and boiler pressure of 50 lbs. is 0·074; add the number corresponding to piston speed of 30 feet per minute, 0·022; this will give the number corresponding to piston speed of 130 feet per minute, 0 096. Multiplying this by area of piston, 3·1416, we obtain, horse power, 0·3+.

The power so calculated is that available for useful work, such as would be developed on a friction brake, in an experiment made by the method explained on page 273 of our volume XXXI.

If any of our readers test their engines in this manner, we would be glad to receive the results of their experiments, which will be useful in enabling us to correct the table, if necessary.

4. To find the diameter of cylinder for an engine to develope a given horse power, when the piston speed, in feet per minute, and the pressure of steam in the boiler are known: Find, in the table, the number nearest to the given piston speed and pressure of steam. Divide the required horse power by 0·7854 times this number, and take the square root of the quotient. Example: An engine is to develope 2 horse power, with a piston speed of 150 feet a minute, and a boiler pressure of 100 lbs. per square inch. What should be the diameter of the cylinder? The number in table, for piston speed of 100 feet, is 0·161, and for 50 feet is 0·081, giving a total of 150 feet = 0·242. Multiply this by 0·7854, and we have a result of 0·1900668. Divide the horse power by the figure 0·1900668, and the quotient is 10·5226+. The square root of 10·5226 is 3·24+, or about 3¼ inches, the required diameter of cylinder.

5. To find the length of stroke, in inches, when the piston speed, in feet per minute, and the number of revolutions per minute, are known. Multiply the piston speed by 6, and divide by the number of revolutions per minute. Example: The piston speed of an engine is 200 feet per minute, and the number of revolutions per minute is 300. What is the length of stroke? Multiplying 200 by 6, and dividing the product, 1200, by 200, we obtain 4 inches, as the length of stroke.

In this article, we have presented the subject as plainly as possible, so that it can be used by all who have queries on power developed by small engines.

EFFECTIVE HORSE POWER OF AN ENGINE WITH A PISTON ONE SQUARE INCH IN AREA, FOR DIFFERENT STEAM PRESSURES AND PISTON SPEEDS.

Pressure.*	Horse power corresponding to piston speed (in feet per minute) of 10	20	30	40	50	60	70	80	90	100	200	300	400
10	·0005	·0010	·0015	·0020	·0025	·0030	·0035	·0040	·0045	·0050	·0099	·0149	·0199
15	·001	·003	·004	·005	·007	·008	·010	·011	·012	·014	·027	·041	·055
20	·002	·004	·007	·009	·011	·013	·016	·018	·020	·022	·045	·067	·089
25	·003	·006	·009	·012	·015	·019	·022	·025	·028	·031	·062	·093	·124
30	·004	·008	·012	·016	·020	·024	·028	·032	·036	·040	·079	·119	·158
35	·005	·010	·015	·019	·024	·029	·034	·039	044	·048	·097	·145	·194
40	·006	·011	·017	·023	·029	·034	·040	·046	·051	·057	·114	·171	·228
45	·007	013	·020	·026	·033	·039	·046	·053	·059	·066	·131	·197	·263
50	·0074	·015	·022	·030	·037	·045	·052	·059	·067	·074	·148	·223	·297
55	·008	·017	·025	·033	·042	·050	·058	·067	·075	·083	·166	·250	·333
60	·009	·018	·028	·037	·046	·055	·064	·073	·083	·092	·184	·275	·367
65	·010	·020	·030	·040	·050	·060	·070	·080	·090	·100	·201	·301	·402
70	·011	·022	·033	·044	·055	·065	·076	·087	·098	·109	·218	·327	·436
75	·012	·024	·035	·047	·059	·071	·083	·094	·106	·118	·236	·354	·472
80	·013	·025	·038	·051	·063	·076	·089	·101	·114	·127	·253	·380	·506
85	·0135	·027	·041	·054	·068	·081	·095	·108	·122	·135	·270	·406	·541
90	·014	·029	·043	·058	·072	·086	·101	·115	·129	·144	·288	·432	·575
95	·015	·031	·046	·061	·076	·092	·107	·122	·137	·153	·306	·458	·611
100	·016	·032	·048	·065	·081	·098	·113	·129	·145	·161	·323	·484	·645
105	·017	·034	·051	·068	·085	·102	·119	·136	·153	·170	·340	·510	·680
110	·018	·036	·054	·071	·089	·107	·125	·143	·161	·179	·357	·536	·715
115	·019	·038	·055	·074	·093	·112	·130	·149	·168	·187	·373	·560	·746
120	·0196	·039	·059	·078	·098	·118	·137	·157	·177	·196	·392	·588	·785
125	·020	·041	061	·082	·102	·123	·143	·164	·184	·205	·410	·614	·819
180	·021	·043	·064	·085	·107	·128	·149	·171	·192	·213	·427	·640	·854
135	·022	·044	·067	·089	·111	·133	·156	·178	·200	·222	·445	·667	·889
140	·023	·046	·069	·092	·115	·139	·162	·185	·208	·231	·462	·693	·924
145	·024	·048	·072	·096	·120	·144	·168	·192	·216	·240	·479	·719	·958
150	·025	·050	·074	·099	·124	·149	·174	·199	·223	·248	·496	·745	·993

* In boiler, by gage.

THE KEELY MOTOR DECEPTION.

We publish on another page a communication from the counsellor of the Keely Motor Company, Mr. Collier, and his colleagues, in reply to an article on the above subject given in our paper of June 26. We devote this space, first, because the parties interested, feeling personally aggrieved by our remarks, have requested, as a matter of fair play, an opportunity for reply; and second, because we have hopes that some of our readers may be led thereby to study out the probable processes by which these gentlemen have been precipitated into this delusion. Such studies may result in useful suggestions or new knowledge. It is not often that the active participants in delusions like this are willing to come forward and chronicle themselves in the broad and public manner that these persons have done. The mental or psychological phenomena will, we think, be found interesting subjects for investigation.

An example somewhat similar to this Keely motor business occurred in London, in 1871, when Dr. William Crookes, the well known scientist, published his astonishing account of the spirit motor of Home, in which the spring gage was made to move by the simple pointing at it of the operator's finger. The truth of this performance was attested by Dr. Crookes, who himself prepared the apparatus, by Dr. William Huggins, by Edward William Cox, a distinguished lawyer, and by numerous other witnesses of undoubted reliability. Dr. Crookes and others were convinced by this exhibition that a new force, which he termed psychic force, had been discovered; but Dr. Huggins, while attesting that the gage moved (in fact, the movement was made to record itself on paper), declined to express an opinion as to how the movement was produced. An account of these performances, with an engraving of the arrangement of levers and gage used, was published in the SCIENTIFIC AMERICAN, page 99, August 12, 1871.

This motor of Dr. Crookes appears to surpass the Keely device in some respects. The power is workable at a low pressure, involves but little expense for apparatus, requires no blowing of air from the lungs, uses no hydrant pressure, and its success does not depend upon "cold vapor."

No one, we believe, has ever questioned the honesty of Dr. Crookes, or supposed for a moment that he had, personally, any hand in giving motion to the gage. The more reasonable supposition is that somebody, in some manner unobserved by those present, applied the necessary force to the instrument.

The human senses are but weak instruments at best, easily played upon and deceived; and those who have most highly prided themselves upon the possession of superior perceptions, by which they were confident of their ability to detect the unreal from the real, have become lamentable examples of the ease with which the mind of man can be entrapped and led astray by mere appearances.

In matters of Science and Mechanics, especially in those branches pertaining to the correlation of forces, it is only by the application of the most careful methods, coupled with the searching tests of mathematics, that reliable knowledge can be acquired and delusive conclusions avoided.

As in the present example of the Keely motor, so in the case of the Paine electro-motor in 1871; the originator of the deception made the most solemn assertions that the machine which he then had in operation derived its sole power from the four small battery cups, which the witnesses saw standing on a shelf at the side of the apartment. The machine was tested, with brakes, as to power, by well known practical electricians of this city, whose names are now before us, who reported large gains of power and detected no fraud. Their experiments were corroborated by many other intelligent witnesses. Special exhibitions were given to capitalists, who pronounced the show wonderful.

We expressed the opinion that the whole thing was a deception, warning the public against investing means in the motor shares. We reproduced the well known mathematics of electric action, we showed the exact amount of force derivable, under the most favorable circumstances, from the consumption of a given amount of zinc and acid, as determined, after exhaustive experience, by the most eminent savans; and from these teachings, we pointed out the necessary falsity of the statements made in behalf of the new motor. Paine, in reply to our strictures, reaffirmed all that he had before claimed for his motor, which he now alleged was far below the actual truth; he said that he was then engaged in building a great and powerful engine which would be ready in ninety days, which would develop 500 horse power from a single cup, completely annihilate the figures given by us, and show to the world that people who, like the editor of the SCIENTIFIC AMERICAN, undertook to doubt or criticise the performances of a machine they had never seen and were practically unacquainted with, were jackasses, or "a fool," as our friend Mr. Collier suggests others might properly say.

"I am familiar," said Paine, "with the experiments of Grove, Carpenter, Mayer, Faraday, Liebig, and a host of others, relative to the doctrines of correlation and conservation of forces. Therefore, I am no tyro, but the peer of any authority you may quote; and as such I unqualifiedly assert that, instead of the miserably small result of 67,000 foot pounds from three grains of zinc (as stated in the SCIENTIFIC AMERICAN) we should realize 67,000,000 foot pounds. The forces developed by the action of a single Bunsen quart cell, if utilized and converted into power, would drive the largest ship afloat with a velocity only limited by the strength of the ship's frame; and you and I will live to see the day, if our lives are lengthened to the usual term, when this statement will be verified, and that, too, without involving the question of perpetual motion."

This sort of talk prevailed with the capitalists; they swallowed the bait, paid in their money, took their shares—"without being urged"—and that was the end of the five hundred horse power, no perpetual motion, one cup, engine, and motor.

The Keely motor deception in all its aspects up to this date is but a repetition of the Paine affair. The originator is very honest; all the people who assist at the deception believe in him and in his machine. They know not precisely how the thing is done, or by what laws it is governed, but they know that it *is* done; and any suggestion to the contrary they seem to consider as a reflection on their personal intelligence and honor.

The Keely performance is as follows:

Keely blows from his lungs, for a period of 30 seconds, into a nozzle upon the generator. He connects the same nozzle, by means of a small rubber tube, with the hydrant, and lets in five gallons of water under a pressure of 26½ lbs. to the inch, then shuts off the water. He opens the valve of a pipe of $\frac{1}{16}$ of an inch bore, between the generator and a gage or pressure indicator; and lo! the gage indicates 10,000 lbs. to the square inch.

Such, in sum and substance, is the Keely motor, as set forth by the learned counsel of the company and corroborated by various mechanical experts, in the statements they have now freshly prepared for the especial benefit and enlightenment of the readers of the SCIENTIFIC AMERICAN: corroborated also by scores of other intelligent persons, so Mr. Collier assures us.

The majority of our readers will doubtless conclude with us that, on the showing of the parties themselves, the whole thing must be classed as a second rate juggle—a mechanical Katie King arrangement, too contemptible for serious consideration.

In our article of June 25, we assumed that the chief purpose of the deception was to wriggle money out of silly people. It appears, from the confession with which Mr. Collier has favored us, that the very first practical use he made of the pretended invention was to obtain money from New York capitalists; that the second use was to procure money from the same source; the third the same, and so on, until the treasury is considered full enough for the time being. We attribute to Mr. Collier no dishonorable motives or methods in financing his company; but we think he confirms our statement as to the uses of the alleged invention. In connection with the letters from the various parties, given elsewhere, some further comments will be found.

Synthesis of Therpylene.

Some time ago M. Berthelot published investigations in which he showed that the essence of turpentine, represented by the formula $C_{20}H_{16}$, resulted from the condensation of a special carburet, $C_{10}H_8$. This last, termed therpylene, no one has ever seen until the present time, when M. Bouchardat announces that he has produced it by synthesis.

MONDAY, the day following July 4 (which this year comes on Sunday), will be, as usual, observed as a holiday in this city. Pressmen, as well as men in other occupations, will suspend work on Monday; therefore if subscribers to the SCIENTIFIC AMERICAN fail to get this issue of the paper till a day or two later than usual, they will know the reason.

THE body of an American, John Blackford by name, has recently been found in a large ice block in the vicinity of Mont Blanc, after several days of thaw. The unfortunate tourist had tried three years ago to ascend Mont Blanc without a guide, and had not since been heard of. Features and clothes are perfectly preserved.