

uring; his walk light, active, and firm. His chief characteristics were remarkable quickness and accuracy of observation, wonderful shrewdness, common sense, and frankness; boldness, decision, and enterprise; rare mechanical skill and constructive powers; special talent for arrangement and organization, and rapid and sound judgment on all matters that came before him.

We are indebted to the *Practical Magazine* for the admirable portrait of this remarkable man.

Scientific American.

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SECRET SOCIETIES AMONG COLLEGE STUDENTS.

Mortimer M. Leggett, the youngest son of the Commissioner of Patents and a student at Cornell University, was recently accidentally killed during the progress of his so-called initiation into the "mysteries" of a college secret society known as the *Kappa-Alpha*. The circumstances were that the deceased went with a party of members of the above fraternity to a creek just outside the town of Ithaca; and there, blindfolded, he was left, with two companions, standing on the brink of a gorge through which the stream runs. Shortly after, a crashing of bushes, followed by groans, was heard, when the remainder of the party, hastening to the spot, found that the three boys had fallen over a precipice some fifty feet in height. Young Leggett, it seems struck on his head, sustaining such severe injuries that death ensued in half an hour, while the others were both seriously hurt.

As one of these college fraternities has thus been the indirect means of causing this terrible calamity, we desire just here to express our opinion on the system of secret societies as generally practiced in our institutions of learning. These associations are bodies of students, organized in principle something after the orders of free-masonry or odd-fellowship. In many, the members are numbered by hundreds, and chapters of a single society often exist in a score of colleges at once. The records are handed down from class to class; and out of each set of freshmen, a few individuals are selected for the privilege of membership. When the plan was started (during, we believe, the year 1827) the idea was simply to form clubs of young men, for mutual improvement in debate and such kindred studies as are better pursued by numbers than by single persons, and to keep alive, among *alumni*, pleasant associations of college life. In course of time, the former innocent and laudable object has been lost sight of, or rather relegated to other associations, now existing in many colleges and not included in the list of secret societies; while the cardinal principle of the younger chapters of the latter organizations seems to be nothing more nor less than simple mischief, rendered attractive by a little mystery and concealed under the cloak of such cognomens (symbolized by Greek letters) as "union of souls," "circle of stars," "lovers of wisdom," etc. If the boyish nonsense resulted in the usual students' pranks, it might be passed over with a smile; but such is not the case. The influence exerted, upon boys fresh from school and for the first time free from direct home influence, we believe (from repeated instances within our personal knowledge, and in connection with one of the oldest colleges in this country) to be in a high degree baneful and demoralizing. Unless a youth has well filled pockets, (in which case rival societies vie with each other to see who shall secure him, or rather his money) he is not invited to membership at all. Once joined, however, and held by working upon his fears through the blasphemous oaths of secrecy that he is forced to take, he is inducted, by sheer force of example, through a routine of profanity, intemperance and gambling; while in many cases, if young and innocent, his course leads to graver faults, committed more through a sense of shame and false pride than depravity, and due to the tacit if not open instigation of his unscrupulous elders,

The sad and untimely fate of Mr. Leggett, just at the outset of doubtless a brilliant and honorable career in the calling which his father has so ably adorned, will, from the circumstances under which it occurred, excite a lively and widespread sympathy. It is the first death, which, to our knowledge, has been owing, though indirectly, to the proceedings of these student organizations; though we have heard of numerous cases of maiming and injury thus caused, and of idiocy and cerebral disease due to the effect of hideous and ghastly paraphernalia upon the imagination of weak minded boys.

There is a notion, which is becoming entirely too prevalent, that colleges are merely convenient places for sending young men to while they are passing through that uncertain and troublesome age, leading to manhood, during which they are expected to sow their traditional wild oats. To this idea, we believe, may be mainly ascribed the barbarities of "hazing," and the no less reprehensible practices of secret societies; while to it also may be traced many of the complaints that our seminaries are inferior in an educational point of view to those of foreign countries. Hazing, already crushed out in the government naval and military schools, is exciting so large a share of public condemnation that there is a fair prospect of its stern repression in colleges generally. The secret societies, we trust, may meet hereafter with similar treatment, at least through the influence of parents if not at the hands of faculties. Harvard forbids their existence among her students, and Cornell at this time would do well to follow her example.

PROGRESS OF PATENTS.

The following were the number of applications for patents made to the principal governments of the world in the year 1872, as given in the published statistics of the British Patent Office:

	Number of Patents Applied for in 1872.
United States.....	18,243
France.....	4,872
Great Britain.....	3,970
Belgium.....	1,921
Austria.....	922
Canada.....	671
Italy.....	521
Saxony.....	259
Sweden and Norway.....	200
Bavaria.....	164
Wurtemberg.....	141
Baden.....	113
British India.....	71
Victoria.....	60
Prussia.....	56
New South Wales.....	42
British Guiana (allowed).....	28
Cape of Good Hope, from 1860 to 1869.....	18
New Zealand.....	18
Mauritius.....	11
Ceylon.....	5
Tasmania.....	5
Jamaica.....	4

The aggregate number of patents applied for in all of the countries above named, in 1872, except the United States, was 14,072, thus showing that in this country the number of patents annually applied for exceeds, by 4,171, the combined number applied for in all other countries above named. The reason for the surprising difference in favor of this country, in the inventive productions of the world, we believe to be due to the superior theory which prevails here concerning the object and uses of patents. We grant patents for the purpose of encouraging the useful arts. We regard the inventor as a benefactor, and place him under no restrictions in the sale or working of his improvement. We grant patents at so low a price that the masses, the poorer classes, among whom the best inventors are found, may readily obtain and hold them.

WOOD AND STRAW PAPER MAKING IN FRANCE.

The improved processes of making paper from wood, straw, and various grasses, as practiced in France now enables the manufacturers to recover 85 per cent of the caustic alkali, used in the reduction of the raw material into pulp. This is a very important economy.

In order to convert wood into pulp, a strong solution of the alkali is necessary. One pound of carbonate of soda is required to produce four pounds of pulp.

By steeping the wood or straw in the alkali solution, the resinous and other gummy matters are separated from the fibers of the material, and become mixed with the solution. To regain the soda for re-use is now the object of the manufacturer. This is done by evaporating the water by heat, then charring the resulting mass, which yields carbonate of soda, then converting the latter into caustic soda.

The evaporation is effected by passing the product of combustion from the fire which heats the alkaline solution through the liquid which is to be evaporated. For this purpose the liquid is thrown up in the form of a thin spray, by paddle wheels. 12½ pounds of the solution, it is stated, are evaporated for each pound of coal consumed. The carbonate of soda is then subjected to long continued washing in a peculiar apparatus until it is fit for burning, and at last 85 per cent of the original quantity of the alkali is recovered. The former methods only permitted the recovery of from 50 to 60 per cent of the alkali.

TWO INTERESTING DISCOVERIES.

The *America*, a daily journal of Bogota, in a recent issue publishes a letter of Don Joaquin Alvez da Costa, in which he states that his slaves, while working upon the plantation of Porto Alto, Paralyba district, Peru, have discovered a monumental stone, erected by a small colony of Phœnicians who had wandered thither from their native country in the ninth or tenth year in the reign of Hiram, a monarch con-

temporary with Solomon and who flourished about ten centuries before the Christian era. The monolith bears an inscription of eight lines, written in clear Phœnician characters, without punctuation marks or any visible separation of the words. This has been imperfectly deciphered, but enough has been made out to learn that a party of Canaanites left the port of Aziongaher (Boy-Akaba) and navigated about the coast of Egypt for twelve moons (one year), but were drawn by currents off their course and eventually carried to the present site of Guayaquil, Peru. The stone gives the names of these unfortunate travellers, both male and female, and probably further investigations will shed more light on the records they have left.

Another and more astonishing discovery, we find announced in *Les Mondes*. It appears that some Russian colonists, having penetrated into hitherto unexplored parts of Siberia, have found three living mastodons, identical with those heretofore dug up in that country from frozen sand. No particulars are given as to this, we fear, somewhat questionable find. From the statements of M. Dupont, of the Brussels Royal Academy, it would seem that, like the reindeer, the mastodon should not now be extinct, and that the animal is naturally the contemporary of the horse, sheep and pig. Hence the announcement is not without some shadow of probability.

NEW ORDER BY THE COMMISSIONER OF PATENTS.

The subjoined order, recently issued by the Commissioner of Patents, will be fully appreciated by inventors and their representatives, exhibiting, as it does, a determination at headquarters that the chronic indolence heretofore prevailing among certain examiners, shall no longer be tolerated.

U. S. PATENT OFFICE, Washington, D. C., October 3, 1873

I have noticed, for more than two years past, that a few of the Examiners are generally from one to two months behind with the work in their rooms. The fact that they so uniformly have about the same number of cases on hand is evidence to me that, with proper effort, they might keep their work closely up to date. The answering of letters and the making of excuses, in consequence of being so far behind, are causes of great loss of time. I shall expect the work of the Office to be promptly up to date by the tenth day of November. If, to do this, it becomes necessary for Examiners to demand of their subordinates more than six hours labor per day, they will do so; but the work must be brought up to that date, and thereafter kept up.

(Signed) M. D. LEGGETT, Commissioner of Patents

The tedious delays in the matter of official decisions often deter inventors from applying for patents, and are equally discouraging to those having cases pending in the Patent Office. With this rule inflexibly observed, early examination and quick disposal of cases will be insured, thereby largely increasing the business of the Office.

PETROLEUM AND PINE TAR GASES.

Some time ago, it may be remembered, we called attention to the interesting and novel experiments, made by Professor Benevides of Lisbon, Portugal, upon the flame of compressed carbonized gas burning in free air. Ordinary illuminating gas and marsh gas (light carburetted hydrogen) were the subjects of the investigation. Recently the same author has conducted similar inquiries, in reference to gas extracted from the residues of petroleum and of the pine and fir tree, with even more remarkable results.

The gas derived from vegetable sources, used in the experiments, was obtained by the distillation of the residue left after the distillation of the roots, by employing a jet of steam at high tension, which was injected into the distilling cylinders. A liquid was produced from which turpentine was extracted, when there remained a black and thick fluid as residue. The latter, submitted to distillation, disengaged a combustible gas which for some time past has been employed for illuminating several light-houses on the coast of Portugal. The petroleum gas was obtained by the distillation of the residuum of petroleum by the Hirzel system. The gases, thus arising, as well as those derived from the pine, are mixtures rich in hydrocarbons, a phenomenon analogous to that observed with ordinary illuminating gas obtained by the distillation of coal, and contain, in variable proportions, protocarburet of hydrogen, bicarburet of hydrogen, carbonic oxide, carbonic and sulphydric acids, etc.

Coal gas possesses in general much of the protocarburet and little of the bicarburet. As the proportions of these gases are variable, the density and illuminating power of the mixture likewise vary considerably. The coal gas, as employed in the city of Lisbon and used in the course of the experiments, has a density of 0.4, and its illuminating power, as indicated by the Erdmann apparatus, is 29.

Pine gas has a very pronounced odor resembling that of burned turpentine: its density is 0.8, nearly double that of coal gas. It is a mixture very rich in carbon and requires burners of special construction with very small orifices, in order to avoid the production of smoke and bad odor, as happens when consuming the gas in the ordinary illuminating gas burner.

The air which combines with the flame in the latter case is insufficient to ensure the combustion of the enormous quantity of carbon contained. The illuminating power of this pure gas is much superior to that of coal gas. In experiments with the apparatus above named, while the latter gas gave 29, the former produced an indication as more than 50. The graduation of the instrument stopping at this point (the maximum width of the slit), it was found impossible to cause the brightness of the pure gas flame to disappear entirely, so that the full intensity of its illuminating power could not be