ARM AND
RY YARD

NG THE BEES

ng Surplus Apartments

apartments should not be
early but neither too late. If
re given some time before
eed them. They are liable to
into the foundation start-
may, too, coat the starters
lls; then they afterward dis-
rk it.

ctions are not promptly giv-
commencement of the nectar
self-evident that honey will
e bees will also contract the
fever, clog the brood nest
y, and do other undesirable
t, when is the best time to
lus apartments? Well, if
hives, flowers and bees. If
em clogged, I give an ex-
of brood combs, should the
er flow not be on yet. The
t is gathered before white
ns in dark, in this locality,
not be stored into sections.

do watch for white clover
I don't give sections if the
out and enter the hives in
t shows they are not getting
his can be learned from ex-
nly) I give surplus apart-
e that has many apiaries,
se, not give supers at short
t I am not giving advice to
piarist."

super that is given a colony
in "bait" sections. Bait sec-
sections filled with comb,
n the previous season. The
should be in the centre of
for here is where the bees
inclined to commence work.
tions are not given, the bees,
Italians, are oftentimes very
mmence work above. One
is enough for a super.
some apiarists, however,
r to put a bait section into
r of the super, the super will
ore evenly filled. This is al-
e has enough bait sections.
ning, one bait section in the
a super will do ten times
tart the bees to work above
e each corner. The corners
idest parts of a super, while
refer to commence work in
est part. A bait section can
the centre besides the four
s, if one has enough.
e bees have the first super
thirds filled, another one
given under it. Toward the
he honey harvest, the addi-
ers should be given on top
t in which bees are working,
under the partly filled ones,
ressation of the nectar flow
lt in many unfilled sections.

tting Out the Bees.

the same plot of ground is
bee yard from year to year,
pers will as a rule set their
n or near the same place
occupied in time past. This
t should be, providing the
t an advantageous one, but
where it can be done with-
eat a sacrifice in some other
he apiary should be re-ed-
ed in such a place as to
many advantages with as
acks as possible.
the first consideration with
keepers is to have the hives
y view of dwelling house
o that issuing swarms may
seen from kitchen and liv-
When only a comparatively
ber of colonies are kept it
essary for one to be con-
the yard, unless the apiary
ed that swarms cannot be
the dwelling. Time is val-
particularly so at the sea-
swarming is in progress,
beekeepers desire to avoid
time watching for issuing
therefore, where it can be
hives should be set within
he kitchen and dining room

hile this is advisable, too
not be overlooked in setting
. Bees should never be set
h used entrances, or near
d public highways. Nor
y be set where it will be
to frequently pass before or
he hives in going to and
house.
es, for the good of the bees,
be set up against or even
south side of buildings and
ubbery. Nor again on steep
es, unless shaded from the
nd hot afternoon sun by
hrubs.
the best location, when at
gentle eastern slope protect-
ard winds by some kind of
k. In a place of this kind
l not be necessary, although
low growing trees or shrubs
it will be well to take ad-
f their shade during the heat
.

, one thing in connection
ocation of an apiary not us-
n into consideration, and
is of more importance than
m at first. This is the con-
l preparation of the ground.
undertaking to establish an
would be well to plow and
plot intended for a bee yard
sow to some low growing
en set the hives in straight
in a place, with fixed spaces
so that a lawn mower could
both between rows and bee-
rs. It would then be a com-
easy mater to keep down
t to always have the yard in
tive condition. Besides he
ess of an unkept yard, it
difficult to get around in go-
d from and among the hives
high growth of grass and
es possession of every avail-
k and corner. Again, grass
choke up the hive entrances
n extent as to seriously im-
progress of the bees in go-
and entering their hives.
vever, an apiary is once es-
in a certain place it is of-
to impossible to move it.
a single season, therefore one
ple with the weed problem
e can. Usually, by arranging
as outlined above, it will be
ier to keep down weeds than
y are set about without re-
ystem.
de from the great advantage
the hives arranged orderly
to keeping down weeds and
s better for other reasons to
n so. In the first place, it
onvenient to work with and
n, and further, records are
tly kept. Then, too, it looks
better that instinctively be-
re at once impressed with the
arance of the apiary and im-
respect for the beekeeper
vocation.—Colman's Rural

The Unrest In India

The Rioting at Rawalpindi

London Times, May 27.—The detailed information received by the Indian Mail confirms the impression derivable from the telegrams that educated agitators were directly to blame for the outbreak of lawlessness at Rawalpindi. It appears that, after three Indian pleaders had been cited to appear before the district magistrate on May 1 to give explanations in respect to seditious speeches at a meeting held on April 21, a second meeting was called by two other pleaders. The notice from the district magistrate was flourished before the assembly, and the crowd were invited to attend the hearing on the following day. During the night the agents of the ringleaders were at work agitating the popular mind. In the meantime, it had been decided to postpone the inquiry, and, this being known in the city, no demonstration at the Court was anticipated by the authorities. However, a mob of 2,000 or 3,000 people collected there, and hooted the appearance of every European. The district magistrate's announcement of postponement of the inquiry was received with hoots and jeers. The crowd was reinforced by a number of men from the railway workshops, and made its way to the native city. The garage of the Punjab Motor Company was attacked on route and two motor-cars were destroyed, together with the furniture in the bungalow occupied by the local manager.

It is significant, however, that the rioters chiefly vented their wrath on the property and agents of the American Mission. The Rev. J. W. Morton, principal of the Gordon Mission College, gave the Civil and Military Gazette a detailed account of these anti-Christian excesses. The missionaries were chased to retreats and stoned; everything belonging to them was burnt, destroyed, or pillaged, and the mission church was attacked. The crowd, says Mr. Morton, carried bottles of oil, apparently for incendiary purposes, and some of them were armed with tools which they knew well how to use. He remarks that it is hard to see what "the attacking of an American mission that brings nearly three lakhs of rupees annually into the Punjab while taking nothing out has to do with any anti-government movement," but admits that the situation of the mission bungalows in the city may partly account for the attack upon them. The senselessness of the crowd is shown by the wrecking of a Government high school, for the establishment of which Rai Bahadur Boota Singh, C. I. E., a local contractor, lately gave 70,000 supees (£4,666). The Indian headmaster of a Presbyterian mission school testifies to the existence of a strong anti-Christian feeling. He speaks of an attack on the Young Men's Christian Association's reading rooms, and of the molestation of a number of poor Indian Christians. The crowd was a vast one, numbering 7,000 or 8,000, and committed this and much other damage in the short time which elapsed before the military could be called out. A squadron of the 10th Hussars and some artillery appeared on the scene as soon as possible and the mob quickly dispersed.

The five pleaders who had promoted the seditious meetings were arrested, and, in connection with the refusal of the Punjab High Court to give them bail, it should be noted that they are charged not only with incitement to rioting and with seditious speeches, but with actual participation in the disturbances, being indicted under the section of the Penal Code which concerns mischief by fire or explosive substance, with intent to cause damage to or destroy a house.

The Arrest of Lala Lajpat Rai.

A significant fact in connection with the disturbances is that Mr. Lajpat Rai arrived at Rawalpindi from Lahore on the night before the rioting. He was to deliver an address on the following day, but was not permitted to do so and returned to Lahore. The arrest of Mr. Lajpat Rai on May 9 was quietly effected, and he was conveyed by special train from Mian Mir, the Lahore cantonment, to a station in the vicinity of Calcutta, for embarcation to Burma. In the course of the day the district magistrate issued a notification in the vernacular announcing Mr. Lajpat Rai's arrest and deportation, and prohibiting the convening of any public meeting during the following four days, on the ground that such meeting might lead to a breach of the peace. The Civil and Military Gazette announced on the following day that it was receiving letters of congratulation to the authorities from Mohamedans of all classes. The elated writers assert that if the authorities had arrested the whole city full of suspects they would not have achieved the supreme result which had been reached by the single arrest of Mr. Lajpat Rai. The letters declare him to have been the head of an incredibly complex and deep-rooted scheme of revolution. The paper named commends the Government for passing by the numerous agents, ministers, tools, instruments, and victims of the mutinous movement and laying their hands on the arch seditionary. It hopes that he will be known no more to the Punjab, "where he claimed to have command of an army of a hundred thousand desperadoes, where every thread of an elaborate and widely-spread campaign of sedition passed through his fingers, where his boast was that no Court dare convict him and no gaol dare receive him."

The Agitation in Bengal

During the few days preceding the arrest of the the Punjab seditionist, the extremist Press of Calcutta was eagerly engaged in efforts to agitate the populace by spreading rumors of threatened Mahomedan rioting and looting. The wildest and most dangerous nonsense was written; and among the displayed lines of the Bande Mataram contents-bills were the following items: "Unrest in Calcutta; Secret Mahomedan Meeting; Punjab Government Gone Mad; Insolent Magistrate; Volunteers Save Mymensingh; Official Repression of Swadeshi settled at Jamalpur." The underlying theory of such allegations was that the Government was showing partiality to the Mahomedans. The special correspondent of the Times of India travelling in Eastern Bengal found at Sirajganj that the Hindus believed they were about to be attacked by the Mahomedans, and were sending away their children and women folk in consequence. The town had been visited a fortnight earlier by Babu Surendranath Banerjee, and he was escorted by a large number of Hindu "National Volunteers," many of whom had marched in long distances from the interior. The Mahomedans keenly resented the presence of these drilled men, "and the present panic may be due to threats which they uttered in consequence of the Banerjee demonstration."

In reference to the mischievous allegations of official partisanship made by the extremist Press, and adopted in certain Parliamentary questions, the opinion of Mr. B. M. Malabari's paper, the Indian Spectator, is worthy of note as indicative of the views of moderate and responsible Indians: "The ultimate cause of the frays between Hindus and Mahomedans in Eastern Bengal seems to be the annoying interference with the liberty of purchasers by the organized Swadeshists. Not only are purchasers annoyed, and traders put to loss—thus being injured in what Carlyle has called the most vital part of man—but it was complained long ago that Hindu zamindars are ill-treating Mahomedan tenants for not patronizing the Swadeshi movement. Some of the incidents reported from Eastern Bengal seem to show that the sowers of the wind are now reaping the whirlwind. The Government could not prevent the preparatory process; it must now step in to save the people from the havoc threatened by the tempestuous operation of Karma." The writer proceeds to cite instances of impartial punishment of Mahomedan as well as of Hindu disturbers of the peace, and refuses to believe that there is any conspiracy among officials to favor one class as against another, or to set the Kilkenny cats to the work of mutual destruction; though it is possible that the natural sympathies of the official protectors of the peace are against the original aggressors. The argument of the boycotters that, as their movement is intended to benefit the Mahomedans as well as themselves, the former would not have opposed them if the officials had not egged them on, is vitiated, in the opinion of the writer, by their not having been content to try persuasion. "Patriotism cannot be manufactured by force, and the interference with the free choice of buyers and sellers could not but have provoked an intensity of resentment which has led to the similitude of a civil war between the two communities."

Mexican Railway Progress

By Percy F. Martin, F. R. G. S.

Mexico can be said to have had nothing in the way of practical railroads, operated for the general public and patronized by them both as freight or passenger lines, until 1857, so that the present year will witness a full half century's experience of this means of communication. Considering the topographical conditions of the country, the amount of progress which has been made is remarkable; and although, to the modern railroad engineer, the construction of a line to cloudland, across great gullies, up steep grades, through innumerable tunnels and traversing great rivers appears of little moment, in the early sixties these problems assumed a very different aspect. It was due to British engineering skill and British enterprise that the first line to Mexico City was constructed. This consisted of but four kilometres, and formed part of what is now the Mexican Railway system. Up to the year 1861 the total length of railroad track in Mexico did not exceed twenty kilometres; but during the war of French intervention, in 1862, this was extended to fifty-six kilometres, while in 1873 the line was further extended to sixty kilometres. Between 1876 and 1882 the mileage was increased to 689 kilometres. In his message to congress April 1, 1897, General Porfirio Diaz, president of the republic, in referring to the extent of railway development in Mexico, stated that up to that time the total amount of construction had reached 11,469 kilometres. So rapid has been the progress made in railway building that there exist today no fewer than 19,200 kilometres, which are being added to day by day. In no country of the world probably will be found a larger number of railroads running at greater altitudes or upon more difficult grades than in Mexico.

The highest point reached by any railroad in the republic today is that attained by the Mexican Central (on their Cuernavaca division) at La Cime, where the line crosses the mountains. This point is 10,000 feet above sea level, and the line winds along the edge of deep barrancas (gorges), turns curves of great acuteness, passes through tunnels of various lengths, and works its way gradually to a point over 5,000 feet below, in the short distance of thirty kilometres. Another remarkable engineering feat is that accomplished by the Mexican railway, which descends a steep gradient with a drop of some 2,550 feet in seventeen miles, while from Maltrata, at an elevation of 5,550 feet to Orizaba, 3,943 feet, the fall is 1,607 feet in a distance of thirteen miles, a total fall of 4,100 feet in about thirty miles and at a grade of 4 per cent.

The Interoceanic railroad, which was formerly a British concern, but has since been acquired and is now worked by the National Lines of Mexico (a government railway) winds around the slopes of the famous Popacatapetl mountain, reaching a height of 9,364 feet above sea level, and accomplishing a drop of about 5,000 feet east of its highest point in the short distance of thirty kilometres of track. On the Toluca division of the National Lines of Mexico the highest point is near the city of Toluca, the capital of the state of Mexico, where the altitude attained is 8,498 feet. On the main line the greatest altitude reached is something over 8,000 feet, where the mountains are crossed before entering the valley of the Mexican Central line. From the northern frontier of Mexico City both of the great trunk lines (the National and the Mexican Central) climb steadily from a few hundred feet above sea level to 8,000 feet, while the same ascent is accomplished by the Interoceanic and the Mexican railways from the coast to Mexico City, the ascent, however, being accomplished in a much shorter distance.

Another remarkable and daring engineering feat has been successfully completed on the Tampico line of the Mexican Central, where the track drops through the Tamasopa canon, and in thirty-five kilometres descends over 5,000 feet. The same drop will occur on the new line now undergoing construction between Tampico and the City of Mexico, which will additionally display engineering surprises of an almost sensational nature.

A large amount of work is already being done upon the Tampico branch in the way of grading, which has been started on the first fifty kilometres. The first station out of Tampico is where the short line is to start from and when completed the distance between Tampico and Mexico City will be shortened by no less than 1,000 kilometres. The first contract for fifty kilometres has been let and contracts for additional sections of the line will be out very shortly.

The port of Tampico is already rivaling that of Vera Cruz, which has hitherto held premier position as a port of entry. Last year Tampico had brought in some 57,000 tons more freight for the Mexican Central line than the previous year, which made an increase of revenue to the company of 65,000 pounds. Nearly 600 vessels entered Tampico last year, and more than that number will probably have entered this year. The export bullion wharf, which the Central company are making at Tampico, will pay for itself, it is believed, in the first year or two. The jetties have already been extended and ar now in a good stat of repair; but when the new short line of railway to which I have referred is made, an enormous amount of additional traffic to the United States of America will come over this system. Freight will be brought to Tampico from the Atlantic as well as from the Mexican gulf ports, and thus on to Mexico City by the new short line; the present route is a long and circuitous one via El Paso, 1,225 miles from Mexico City. As I have said above the saving by the new route will be nearly 625 miles (1,000 kilometres).

The Mexican Central has also constructed a line, which had hitherto been deemed practically impossible from a physical point of view, starting from its present terminus at Tuxpan to the city of Colima, where it will join the existing line from the city of Colima to the port of Manzanilla, and will thus bring into existence the first complete transcontinental line in the republic of Mexico. Some idea of the seriousness of the undertaking may be gleaned when it is stated that the total cost of the extension of the line from Tuxpan to Colima, and the broad gauging of the existing line from Colima to Manzanillo, will be approximately $10,000,000 Mex. 1,000,000 pounds). Some portions of the line are very much more costly to construct than others, the ground varying considerably and offering little or no opportunity for a general or average computation. Upon some portions of the line some altogether colossal engineering work has had to be undertaken. At kilometre 120, for example, a long, deep cut through the sides of the mountains has been necessary, it having been found, after some costly trials, that tunnelling was impossible owing to the character of the rock and the loose, shaley substance met with. The cut is some 400 feet deep and this, with other work, at the same kilometre has involved an outlay of 28,000 pounds. Round about this portion of the line the work is costing, on an average, from 10,000 to 22,000 pounds a kilometre. At kilometre 24 it is 15,600 pounds; at kilometre 225, 17,000 pounds, and so on, the amount largely depending upon the amount of tunnelling and bridging which has had to be done.

The longest, and consequently the most expensive, bridge will be that across the deep barranca, or gorge, known as Queseria. This bridge will be of steel, and when erected will weigh over 1,650,000 pounds. It is being constructed in four deck spans, one of 164 feet, one of 80 feet, and two of 100 feet each. At this same kilometre (No. 228) there is also being carried out a big tunnel and a deep and difficult "fill," so that the cost will come up to nearly 22,500 pounds. The total cost of the Colima-Tuxpan section, apart from the Colima-Manzanillo portion, will be 600,000 pounds.

Japanese and native laborers are constantly being imported on this work, the present force employed being some 5,200. Over 1,500 Japanese laborers were imported during the last few months, but of these over 250 promptly deserted for the United States.

So far, the track laying has progressed to a point eleven kilometres beyond Tuxpan, which leaves a gap of fifty-seven kilometres intervening between the end of the line and Colima; and with work progressing from both ends of this gap the intervening distance should be completed within a few months. According to the terms of the contract, the work should be terminated by, the end of 1907, and judging by the progress already made and counting the length which will be done from the Colima end the route ought to be finished and open before this time.

Colima, lies 3,000 feet below Tuxpan and the intervening distance naturally provided a troublesome and complicated question in regard to gradients. By exceedingly skilful measuring and delineation effected by the survey department, however, it is possible to say that the maximum gradient on the whole of this section will not exceed 2 per cent. There are necessarily a great number of tunnels, some of considerable length, but the majority are short. The longest will be 630 feet. Of bridges there will be no fewer than twenty; one-half of this number have already been received and erected, and the whole of them will come from the United States. Very flat curves have been built on the Tuxpan-Colima route, and the cost has been very heavy, but in the opinion of all experts this policy is a sound one, and in future years, when the line becomes fully active, the saving in haulage, loading, wear and tear, and freedom from breakdowns will be found sufficient compensation.

American Life and Death

American life, according to our patriot orators, is the most blissful possession, or status of being. But they tell us next to nothing about American death; they do not explain to us how it is, or why it is, that if life with us is a benediction and a psalm, we are so eager to get rid of it, or why we protest so little, indeed, not at all, when vast numbers of our fellow-countrymen have it taken from them by main force. If our country were heathen, now, we might devise engines for their protection, and, assuredly we would establish societies, and gather many funds in aid of them. As it is, we let them take it out in oratory.

More than half a million persons suffer accident in the industries of this country in a year. Nobody cares very much excepting the immediate mourners. The annual deaths and injuries in the arts of peace in the United States alone, equal in number the average annual casualties of our civil war, the Russo-Japanese war and the Philippine war all together. Can you gather on this issue in New York a congress as large and distinguished as the recent peace conference in New York? I doubt it. We keep careful statistics of the casualties of war. We keep hardly any statistics of the casualties of peace.

Behold now!

The number of violent deaths, from all causes, in this country exceeds 83,000 in one year. "Exceeds," I say, because that is merely the recorded number, 83,000, and the records are kept for an area which comprises only four-tenths of our population! Six-tenths, we perceive, do not greatly care about the matter. Not all our states have factory inspectors, for example, and only a few of the states that have them collect or publish careful statistics. As recently as 1902 only ten states required owners of factories to make reports to factory inspectors, or other public officers, concerning accidents on their premises.

There are reliable statistics of railroad accidents, thanks to the initiative of the interstate commerce commission, but no authority has prepared statistics of casualties in the building trades. It has frequently been stated that each story of a steel skyscraper costs one human life, but there are no authoritative figures. The last census showed that the building trades employ 1,250,000 skilled workmen. These, of course, are fewer than the unskilled workmen employed, but the number of the latter is not known. Yet the vital statistics of these trades are lacking.

In the mechanical and manufacturing trades the vital statistics are curiously incomplete, as I have already said when mentioning the factory inspectors. But there were 5,000,000 persons employed in these trades when the last census was taken.

Concerning mines and quarries, there is rather more information, but this also is incomplete. Over 5-1-2 million miners and quarrymen were employed when the census of 1900 was taken. The increase in seven years has undoubtedly been large. In the year 1905 there were 2,159 deaths in the coal mines alone. This was an increase of 94 per cent in ten years. During that period the population of the country increased 20 per cent. Therefore the deaths in the coal mines increased at a rate 4.2 times faster than the rate of increase in the population. In the last five years, for which figures are given, the increase of deaths in coal mines was 46 per cent. It is only for the five years ending with 1905 that the figures for injuries are known.

On the last year mentioned there were 4,402 injuries, an increase of 21 per cent in five years. Professor Doten of the Massachusetts Institute of Technology, to whom I am indebted for much assistance in dealing with the statistics of industrial casualty, has stated that for every 175,000 tons of coal mined in this country one life is lost, and that for every 120,000 tons of Pennsylvania anthracite one life is lost.

Our incomplete mortality tables show that deaths from accident in the industries are more than twice as numerous per thousand of the population than is the rate in Great Britain. What the showing would be if the reports were carefully collected and published in every state one can only guess with a shudder. But if we cared sufficiently about human life we would make them the basis for preventive measures. Publicity is needed to stir the people.

"How," asks Dr. Strong, "how shall we account for our stolid indifference? This destruction of life and limb does not take place in a corner. Doubtless many accidents occur which are never reported, but every day the papers repeat the sickening story; and this perhaps is the very reason why the facts fail to impress us. We become hardened by endless repetition. If, by some miracle of prudence, or of providence, all accidents of every sort could be prevented for a year, and if then a half a million should occur in a day, the shock would arouse the nation and something would be done. But the dead are quite as dead, the bereaved are quite as desolate, and the maimed are quite as mutilated and helpless when these casualties are distributed through every day of the year as if, like the losses of a great battle, they had been crowded into a single day. It is well to end the barbarities of war. Is it not time to place some limit to the barbarities of peace?"

Violent deaths of all kinds, including suicides and homicides, as well as accidents, are at the rate of 1.04 to every 1,000 of our population. But Professor Doten has shown that that of passengers carried on and persons employed by the railroads the death rate is 6.2 per 1,000, so that when we board a train our chances of meeting a violent death are increased 500 per cent!

The death rate among trainmen during the last three years has been eight per 1,000. But among one class of trainmen, the brakemen, the rate is double that. In fifteen years there has been a decrease in the mortality among trainmen, because, owing to the initiative of the interstate commerce commission, congress compelled the railroads to use automatic couplers and air brakes. In the ten years after 1893 the accidents due to the operation of coupling decreased two-thirds. In this fact there is sufficient justification for congress to compel all railroads engaged in interstate commerce to use interlocking systems for the operation of block signals and switches.

I say "interlocking" system because the phrace "block system" is meaningless. There are so-called "block systems" which do not block. There are thousands upon thousands of miles of these. And here is an illustration of the manner in which they are worked. I quote from a report which comes to hand while I am writing this article:

"A freight train was coming toward Birmingham (Ala.) and a fast train was permitted to enter the block. The fast train crashed into the freight. Three freight cars were thrown across the east bound track almost at the instant that a wrecking train passed. The wrecking train struck them and practically the whole freight train piled into a ditch. Two men were killed and seven injured."

So much for a "block system" which does not block, and which permits a fast train to follow a freight in the same block. Perhaps the railroads will some day learn that a quart will not go into a pint bottle.

Yes, American life is a very fine thing, but American death is amazing. —Arthur Warren in Boston Herald.

Ptomaines of Passion

That the influence of the mind upon the body is great and little understood we have had abundant evidence in the temporary success of alleged wonderful cures of faith healers and charlatans under many names. A work describes some of the psychological experiments of Prof. Elmer Gates, showing how potent is the effect upon the chemistry and tissue changes of the human system. Accurate observations upon the arm, when the thought of the owner was concentrated upon it, revealed an increase in size and in the blood circulation, and a regular course of directed thinking for a certain time daily gave a permanent development of the limb. When a calm man breathed five minutes into a cold tube the volatile constituents of the breath condensed into a colorless liquid. When the man was made angry a brownish sediment appeared as the result of the changed mental condition, and in like manner the perspiration from the skin or exhalation from the lungs gave a gray sediment with sorrow, pink with remorse, and so on. Injections of the brown sediment of anger produced nervous irritability in men and animals. Hate proved to be accompanied with a greater expenditure of energy than any other passion, and it precipitated several chemical products, of which a small portion was fatal to a guinea pig, while it was estimated that enough would be eliminated in an hour to kill scores of people. The hate ptomaines, it was concluded, represented the deadliest poisgn known to science.

Tests to Avert Mine Disasters

The United States Geological Survey within a few weeks will establish, probably in the Pittsburg district, an experiment station for the purpose of testing explosives used in coal mining, the ultimate object being, if possible, a reduction in the number of mine disasters resulting from gas and coal dust explosions. Miners' safety lamps will also be tested at this station. Explosion investigations will be conducted both in the laboratory and in the mines.

The station will consist of an explosive gallery, rescue room, observation house, lamp testing rooms and explosives laboratory. The gallery is to be made of boiler plate and will be in the form of a cylinder, 100 feet long and 6 feet in diameter. A series of safety valves on hinges will be arranged along the top to allow those the escape of gas following an explosion. Port holes along the sides, covered with half-inch plate glass will allow those in the observation house to see whether an explosion has taken place in the gallery during the tests. The cylinder will be filled with firedamp and air, or coal dust and air, and the explosives will be hurled into the gallery by means of a steel mortar fired by electricity from an observation house sixty feet away. The firedamp and air will be thoroughly mixed by an electrical fan.

Tests will be made with various explosives, and the maximum quantity of each explosive that can safely be used in mines will be published under the head of "permissible explosives." Explosives known as "safety explosives" in which the temperature at the point of detonation is low and the flame of short duration, will have a higher "limit charge" than the less safe explosives. The rescue room will resemble the interior of a mine, and during tests will be filled with smoke. The efficiency of all apparatus for sustaining life will be determined by a series of tests. Miners will be shown how to rescue their fellow miners.

All explosives will be first tested by the Pendulum test and the Trauzl test, to arrive at the quantity to be used in making experiments in order to get the same disruptive force. In the Pendulum or English test, a large pendulum weighing several tons swings backward when the force of an explosion is exerted upon its face. The distance of the swing is indicated by a delicate sliding rule. The explosive is fired from a mortar and the force of the explosion is played against the face of the pendulum. The Trauzl test uses a cylindrical lead block 20 c. m. high and 20 c. m. in diameter. The weighed explosive with the detonator is placed in this central cavity and tamped with a known quantity of sand and moist clay. After the charge has been exploded the pear-shaped expansion of the bore is measured by filling it with distilled water at 16 degrees C.

A pressure guage will be used for measuring the actual pressure in square inches developed by the detonation of various explosives. The analysis of the products of combustion will also be made. The heat of decomposition of all explosives in terms of calories will be ascertained by detonating large quantities in a bomb. The explosives will be fired from the mortar at night, and the length of the flame will be determined by photography. The time of the flame will also be determined by an electrical apparatus. The rate of detonation will be determined by an electrical rotary recording drum.

Actual experiments will be made in mines to lessen the waste of fuel in mining operations. Different methods of using explosives in mines will be investigated with special reference to increasing safety and efficiency.

The experiments will be under the direction of Joseph A. Holmes, chief of the technologic branch of the Geological Sruvey. Dr. Charles E. Munroe has technical supervision of the tests which will be conducted at the station. Clarence Hall, explosive expert for the geological survey, assisted W. O. Snelling, will have immediate charge of the experiments Mr. Hall has recently returned from Europe, where he made a study of the foreign government testing stations.—Iron Age.

Opinions About People

Mr. Winston Churchill, speaking at Edinburgh Reform Club (May 18), referring to the necessity for land reform said that he did hope that Lord Rosebery was going to be with them in the land question, says Public Opinion. It was a great question for him, and by his action his position in history might easily be determined. If it could be thought that a man who had held great office in a democratic party and had been leader and head of Liberalism had been influenced at all by his own personal possessions in the world to take a hostile view of a great social reform, that would be a great injury to his fame and reputation in history. Speaking of an admirer and friend, he most profoundly hoped that Lord Rosebery's unequalled talents and genius for commanding the attention of the country might be permanently devoted to the purposes of progress and reform, and that he would be for them and not against them in that great conflict into which they were most steadily drifting.

Sir Benjamin Baker.

By the death, in his 68th year, of Sir Benjamin Baker there has passed away the most famous engineer of modern times. Beginning life in a South Wales ironworks, the hero of many great works all over the world, he will be best remembered as the inventor of the pneumatic shield, which enabled tunnelling in shifting soil and "tube" railways possible; the builder of the Forth cantilever bridge, erected to withstand a wind pressure, the force of which had not been gauged; and the man who designed the great Assousan Dam, which, by holding back the waters of the Nile until the land had most need of them, turned 300,000 acres of desert into fruitful soil.

After his experiences in the South Wales ironworks Sir Benjamin Baker became a partner of Sir John Fowler, the consulting engineer, and was assisted in the work of the Forth Bridge (which won him his knighthood) by Sir William Arrol and at Assousan by Sir John Aird. He designed the vessel which brought Cleopatra's Needle to England, planned the ship railway across the Bay of Fundy, and had projected an alternative to the Suez Canal by way of Cairo and Alexandria. Personally he was "thorough." Whilst the Forth Bridge was being constructed, he crawled along the storm-swept platforms to see how his cantilevers did their work. The instance is typical of many.

Gladstone's Grandson.

Gladstone's grandson—W. G. C. Gladstone, of New College—is now president of the Oxford Union. The Isis says of him: "The achievements of his political career did not begin nor will they end at the Union. His energy and enthusiasm enlivened the meetings of a house debating society at Eton. His insatiable love of political warfare has carried him to provincial platforms, and to office in the Palmerston and Shaftesbury Clubs.

"Such places, though surely vanities, are apt to be awe-inspiring; and we sympathize with the rather timid foreigner who was introduced to our Idol, and hastily stammered out, 'Aha, you are ze Congo Atrocity!' This accusation is cruel, to say the least of it! for when he is not 'addressing the house' Mr. Gladstone is as mild as a gazelle. He would not be rude or discourteous even to a Congo trader. He would offer him chocolates.

"Of course, Mr. Gladstone had a grandfather. So had most of us. But our grandfathers were ordinary grandfathers and wore low collars. Thus it came about that our Idol's business in life was predestined to be shooting, and his recreation politics."

Mr. Carnegie and Prof. Munsterburg.

Principal Rhys tells an interesting incident which occurred at the opening of the Carnegie Institute. "Nothing surprised me more," he says in the South Wales Daily News, "than the adroitness and vigor with which Mr. Carnegie acted whenever he presided. He was the only chairman who could limit Mr. Stead. He insisted that Mr. Stead's health required close attention. But there was a Dr. Munsterberg from Harvard, who spoke at great length to show that the German people did not find their burden of taxation excessive; in fact, that they delighted to pay, and that they thoroughly approved of the conscription; he made other and similar assertions, to which the audience listened with strained attention. When the learned speaker had finished his reassuring remarks, the chairman rose at once and declared that at his age no professor could fool him; he had questioned too many Germans at Pittsburg and elsewhere as to the reason why they had come away from Germany; one said it was to avoid military service, another that he had sons whom he did not wish to see entering a barracks, and others gave similar reasons. Over and over again he had made the inquiry, and practically elicited the same kind of answer. I cannot repeat the exact words, but Mr. Carnegie's criticism was simply crushing—so crushing, in fact, that a chairman of a public meeting in the Old Country would have hardly made it; but the temptation was too strong, and the vast audience enjoyed it profoundly."

Lord Elgin a Colonial.

"The Earl of Elgin, who this week enters upon his fifty-ninth year, is one of the few Colonial Secretaries who have themselves been of Colonial birth. That circumstance alone has, no doubt," says the Leeds and Yorkshire Mercury, "helped to smooth away many of the difficulties of the office which he fills. But Lord Elgin is a remarkable man in many ways. He was, for example, a member of the first School Board ever created in Scotland, and there are many Scots today who regard the period of his Viceroyalty in India merely as an interlude in his service to their country. As Viceroy, Lord Elgin made a great name for himself as a wise and beneficent ruler."

Mr. Brinsmead's 70th Wedding Day.

"Mr. John Brinsmead and his wife each 92 years of age, celebrate their 70th wedding anniversary on June 3. Mr. Brinsmead was born in North Devon on October 13, 1814 ,and was apprenticed to a cabinet-maker in Torrington. As soon as his time was out he came to London, where he entered the pianoforte trade. He founded the great house of Brinsmead in 1837, and on June 3 of that year married Miss Susan Brown, the daughter of an officer in the 92nd Highlanders. He is the inventor and introducer of many of the greatest improvements in the pianoforte, which are now adopted throughout the world. Mr. and Mrs. Brinsmead celebrate their 70th wedding day," says the Daily News, "by receiving all their relatives, friends, and workpeople at their residence at Regent's Park, by inaugurating a provident fund amongst their workpeople (to which fund Mr. Brinsmead is presenting £1,000), and by making who has worked for them for over 40 years—of these there are quite a number—and by sending all their employees, together with their wives, to one of the London theatres, for which purpose they have engaged over 500 seats."

Method of Testing Coal

For some considerable time past the subject of testing the coal used in the locomotives on the Danish State Railways has occupied the attention of the authorities at Copenhagen, and the matter has been carefully studied by A. Jacobson, their chief chemist. When the work was taken in hand it was naturally felt that before any useful steps could be taken towards ascertaining the value of any coal, it was necessary to know for what purpose the coal was to be used; for it had been found in several instances that coals for locomotive purposes, which had been tested in the laboratory connected with the Danish Railways, and which were deemed fit for use in locomotives in actual service, afterwards turned out to be of less value than had been anticipated. The reason for this was of course that the conditions were not the same. In actual practice several things, which were absent in the laboratory tests, affected the result. In the laboratory the heating value of the coals was ascertained by the aid of the calorimeter, but this method was found not to be a sufficiently reliable indication as to the heating power of the same coals when used in practice. Of course, if the coals showed a low burning value in the laboratory, they would naturally have a low burning value in a locomotive firebox. It was, however, found that it did not necessarily follow that a coal having a high calorific value in the laboratory would also show up well when used in a locomotive. In the calorimeter every particle capable of being consumed could be burned, while in the locomotive more or less coal is always left unburned, and a certain amount of heat (depending on circumstances) is carried off with the varying amount of air which it is found necessary to supply for purposes of combustion. It was ascertained that the amount of these losses varied greatly with different kinds of coal, and the laboratory value of the coal was not a safe basis on which to depend when deciding what coal to adopt for actual use. In order, therefore, to test the coal under conditions as nearly as possible to those of everyday practice, Mr. Busse, the chief mechanical engineer of the railways, had an old locomotive installed in the round-house in the Copenhagen good yard, where a number of tests were carried out. The cylinders and all the moving parts of the engine were removed, and the steam generated was passed either direct from the boiler through a pipe into the chimney, or a part of the steam was led through pipes to the sea-shore, which was close by. The amount of coal consumed and the water evaporated during each test were carefully measured. The water used was that commonly supplied to the locomotives, and was softened so as to remove its scale-forming properties. The boiler pressure during the trials was about 114 lbs. per square inch, and the steam at this pressure, being led into the chimney, caused a draught of nearly 5-8 in. of water, in some cases as much as 7-8 in. of water being obtained. Arrangements were made whereby the dust carried into the smoke-box and up the chimney under varying draughts and with different coals could be measured. Samples of these dusts were afterwards analyzed and their calorific values obtained. The amount of ash left on the grate at the end of the trial was also weighed, and and it was noted how much slag there was on the fire-bars, and to what extent this slag had burned into the bars. By means of this apparatus some very useful information has been obtained with regard to the different kinds of coal, which information would not have been forthcoming had laboratory tests only been relied upon. A complete record of these tests, with the results obtained, may, however, be studied in Ingenioren for Augnst 25, 1906, should any of our readers be desirous of further particulars. The paper is published at 133, Norregade, Copenhagen.—Engineering.

A Wedding Feast Salad

Chicken salad is the most dependable relish to serve on this occasion. It never holds the possibilities of ptomaine poisoning as fish may and it does not wilt as a green salad would, if the reception runs for some length. Here is an old family recipe: This quantity should make very nearly two quarts of salad, sufficient for twenty people, if served with sandwiches and ices. Select two plump fowl, not too old, simmer in boiling water until tender. Do not cut them up before cooking, and do not cook in cold water as this draws out the juice. When tender, remove from the liquor, cool and cut into dice. Add one pint of celery cut in dice, mixed lightly, sprinkled with a little salt. If you do not like oil, use this dressing: Beat the yolks of seven eggs, add seven pinches of mustard, seven teaspoons of sugar; place in a porcelain stew pan, add slowly seven tablespoons of boiling vinegar. Cook slowly until thick; mix with the chicken, add one cup of good sweet cream, whipped light, and salt and pepper to taste. If you like oil, try this mayonnaise dressing: Into the well-beaten yolk of one egg, add drop by drop one pint of olive oil. Boil two eggs hard; rub into the yolks a dash of cayenne pepper, one-half spoonful salt. Add this to the yolks and oil. Now add finely chopped whites of the eggs and juice of half a lemon; mix well, then add the well-beaten white of the uncooked egg, and the dressing is ready for use.