### SCIENTIFIC AND PRACTICAL.

PELLERS.

Design and Work states that the Lords decision has been arrived at after a sedes were teleced on aupports twelve inches spart and first subjected to a heavy pres-sure applied in the middle of the bars, and afterwards to linguist by a weight of 50 lbs falling from a height of five fect. With a steady pressure the gun metal lara slipped between the supports or broke with a strain of 28 cwt, while the manganess bronze bars required 54 cwt to break them. Tested by impact, the gun metal bara broke with from seven to eight blows, while it took from thirteen to seventeen blows to break the manganese brance bars. The ultimate more than that of the gun metal, thus showing nearly double the strength, with superior toughness. The advantages claimed for manganese bronze over gun metal are first, a considerable saving of actual weight of machinery, and, accondly, that it enables a thinner, and consequently a better, blade to be made offering less resistance to the water, and equaling in attempth the gun metal blade of greater dimensions.

#### STRENGTH OF BRONZES

In a paper lately read before the American Society of Civil Engineers, Professor R. H. Thurston describes a new bronse alloy of maximum strength The properties of this alloy were ascer-tained by Professor Taureton in the course of his examination in the mechanical laboratory of the Stevens Inetitute of Technology of a series of thirtywhich the propertions of the copper were varied from 10 to 80 per cent; of the tin, from 10 to 80 per cent, and of the zinc, from 10 to 70 per cent. The results of these experiments pointed to an alloy of the proportions of copper 55, zinc 43, and tin 2, as likely to be that preseasing maximum strength; and on Professor Thurston making the alloy he found it to possess a good colour, to be clese grained, and susceptible of high polish It was also found to have im-turness attempth, considerable hardness and moderate ducility, while it could also be forged if carefully heated. For purposes demanding toughness as well as strength, Professor Thurston found, however, an alloy with less the to be preferable, and he gives the propor-tions of copper 65, tin 0.6, and sinc 44 5, as affording the best results. This alley, lie states, has a tensile strength of 68 900 pounds per square inch of original area, and 92,136 pounds per square inch of fractured area, while it elongate d from 47 to 51 per cent. (length of test sample not stated), and reduced to 0.69 to 0.71 of its original diameter before fracture, He also states that the shavings produced by the action of the turning tool on this alloy curied closely, and were lough and strong like those of good fron. Professor Thurston also referred to an alloy discovered several years ago by Mr. J A. Tobin, but which appears not to be generally known. This alloy, which consists of copper 68 22, tin 2.3, and zinc 39 48, bad, when cast, a tensilo atrength; of 60,500 pounds per square inch of original section, while when rolled out its fuch, and when moderately and carefully rolled cold to 104,000 pounds per square inch. It could also be best double either not or cold, and was found to make excellent bolts and nuts, while it could be forged at a low red heat.

# SOUNDS IN THE TELEPHONE.

Having remarked that telephones transmit along with speech sounds of an unknown origin, the author has undertaken experiments in order to find out if the causes of these sounds are not those which oppose telephonic communication at great distances. To eliminate all possible sources of error, the following arrangement was adopted. A line of twenty meters was laid on the floor of several rooms, all the doors of communication being closed. It was connected at one end to a pair of telephones by means of flexible conductors, designed to arrest sounds which might communicate themselves mechanically along the metal to the telephones. The circuit was completed between these onductors by another flexible wire, on the path of which was an interruption pedal, rendering it possible to cut the circuit without changing at all the nature of the communications between the line and the telephones, and to prove that the sounds heard had an electric origin. The operator acted at the other end of the line which was not connected, directly or by induction, with any electric generator, fie observed that the current produced by the friction of two wires of the same kind or of different kinds and that produced by closing a pressure scrow were heard in the tolephones. It is easily understood is claimed, faily equal to one speem can is claimed, faily equal to one speem can of the one in that when suspended, telegraph wires die, and, therefore, equivalent to six or of the one is eight of the lights of an ordinary eafety.

affections by ligatures, more of less caping games to any required extent by perfect, which are in a state of constant increasing the quality of air faced agitation. But this cause of failure may be removed by soldering the quality of air faced through liange explosions have taken place—notably that at the libondia Vacb. ADVANTAGES OF BRONZE PRO- attenders by figatures, more of less or an admirate have ordered the Colors steel of tying them. Unfortunately us now in course of construction at there is another cause, the currents due l'ortamouth, to be fitted with a mangan- to the influence of the effective of the ordered of the effective or the currents due to bronze propelle, is placed of the fitted of the ordered of the effective or the currents due to bronze propelle, is placed of the fitted of the ordered of the effective or the currents due to be propelled or placed of the ordered of the effective or the currents due to be propelled or the be removed by soldering the wires inof kun metal originally ordered. This author placed in the circuit, at the and opposite the telephones, a red of from of commutative experiments made with 1 50 meters in length, and connected to of comparative experiments inade with 1 50 morers in rengin, and connected to the two metals in the presence of Mr the system by supple conductors. Farquitarson, of the Admiralty, at the This rod was struck sometimes transverses of Hesses, Mandalay, hons & versely and sometimes longitudinate of both metals, one inch square, occasioned by the blows were discovered by annual transportation of the sounds of the standard of the sounds. tinctly reproduced by the telephones with their peculiar characters. This ex-periment if repeated with copper or brass rods, gave merely negative results. It seems that the phenomenon is only produced as an effect of the vibrations occasioned in the wire. Future experiments must decide whether it is due to a molecular change which the metal undergoes or to a peculiar notion. If, as it is probable, the vibrations caused by the wind act upon the lines of iron wires like the blows upon a rod, it appears difficult to correspond at great distances languages to the latter was also in both cases with the existing means of transmission, more than that of the gun metal, thus till a method has been found of causing the telephones to speak by the aid of electric action so powerful that the currents arising in the line itself coase to be an appreciable cause of disturbance. -M. A Gaife

#### SCIENTIFIC PROGRESS IN UNITISH SHIPBUILDING

British shipbuilding has made more advances during the last half century, according to the Westminster Review, than in the thousand years preceding it "Neventy years ago the science of naval architecture had no home in England forty years ago it had no official recogni tion, and was but little studied by the great majority of British shipbuilders Twenty years only have passed since the scattered adherents of the scientific the scientific method formed themselves fato a pro-fessional association, and initiated a movement that has placed the country at the head of the maritime nations in both the science and practice of ship-building. The progress already made is great; and there is reason to hope that even greater progress will be possible the original investigator, the trained when naval architect, the practical shipbuilder and the experienced seamen all heartily co-operate

## NOVELTY IN SAFETY-LAMPS.

At the recent meeting of the members of the South Walos Institute of Engineers an interesting paper. "Un Patent Safty-Lamps and the Prevention of Explosions in Crossley, MI M.E. The constant and increasing number of explosions to mines, consequent loss of life, damage to property, and their attendant evils, has, he says, been to him the subject of much thought and consideration, reculting in the wo,kand consideration, resulting in the wo,king out of a form of asfety-lamp which will, be feels confident, ensure the attainment of the objects desired, and at the same time increase the lighting power.

The practiple of the lamp and the method of supplying it with his area both were old.

of supplying it with air are both very old, but in matters of this kind it is frequently a small matter of detail which makes the difference between fallure and success. The flame is surrounded by two concentric cylinders between which air circulates, and it is also proposed to supply the lampe with atmospheric air through pipes. He considers that the safety-lamp should be worked with atmospheric air extraneous to the cililery itself, which can be readily done by distributing air pipes through the colliery main roads and workings exactly in the same money is workings, exactly in the same manner in which gas pipes are now distributed throughout houses. The pressure required is about equal to that of gas in an ordinary supply pipe, and it oan be readily supplied from the gasholder, which is in turn kapt full by means of a fan or other turn kept full by m blowing appliance.

The lamp itself is entirely closed to the outside atmosphere, except the outlets at the top for the escape of the products of combustion. It consists of an ordinary or other soltable oil vessel and wick; a closed air reservoir which is used for disother squaue on vener and wicz; a closed air reservoir which is used for distributing the air to the parts required for keeping up combustion, and for keeping the lamp itself cool; and further, of two glass cylinders arranged concentrically with small air spaces between them. The air for combustion passes up through the inner glass cylinder. There is also a current of air between the outer and lower glass cylinder; which keeps the outer one cool; and mixing with the products of combustion from the faner one also cools them to a post at which they may safely be allowed to escape. His suggestion also includes taking the lamps from the place where they are cleased and prepared to the working parts of the colliers, which he proposes to effect by the aid of a tank boste, which is so arranged as to contain atmospheric air at a high pressure—(asy) borte, which is so arranged as to contain oogie, which is so arranged as to contain atmospheric air at a high pressure—(eay) 200 to 300 lbs per square inch. This bogie is fitted with small stop-cocks, and capable of carrying at least 100 lamps at a time, for distribution in the workings. The lamps can also be arranged to burn in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same manner as an ordinary safety—lamp distribution in the same lamp distribution i lamp during the time it is being carner from the place where it is prepared to the place where it is to be fixed for use; but be prefers to make the matter doubly secure by having no such provision, and by working it with compressed air from the boose, as an exacted

bogie, as suggested.
The light produced from one of Mr.

a auso may occasion snuch trouble, since I lann. This high luminosity can be said to these litter are formed of pieces of fron assumed with this lamp, because it is forwire connected to each other and to the sible to reduce the temperature of the even Valley, with a loss of 178 lives—through the opening of the Davy lamp to provide more light, and he has, he says, in his famp secured the maximum light-gising power. The additional cost consequent The St. Paul Planer Press contains the upon the introduction of his lamp in monta. place of the ordinary safety-lamp would the from 4500 to 4600, but this sum forms oply a comparatively small item in the large expenditure necessary in a colliery any importance,-london Young

# GYMNASTICS AS A CURE OF DISEASE.

Physical vigor is the basis of all moral and bodily welfers, and a chief condition of permanent health. Like manly dyspepsis disappear like rust from a busy ploughsbare "When I reflect on the immunity of hard-working people trom the effects of wrong and overfeeding," says Dr. Boerbaave, "I cannot help thinking that most of our fashionable diseases might be cured mechanically instead of chemically, by climbing hitterwood tree or chooning it down. if you like, rather than swallowing a de-

coction of its disgusting leaves.
The medical philosopher, Asclepiades, The medical philosopher, Asclopiades,
Pliny tells us, had found that health
could be preserved, and if lost restored,
ly physical exercise alone, and not
only discarded the use of internal remedies, but made public declaration that
he would forfeit all claim to the title of
a physician if he should ever fall sick or
a strandingly strains and these within and blessed white
the size of Manitoba, Mr. Tupper describes die but by violence or extreme old age Asclepiades kept his word, for he lived upward of a century and died from the effects of an accident. He used to prescribe a course of gymnastics for every form of bodily attment, and the same physic might be successfully applied to certain moral disorders, in and borses and cattle could obtain applied to certain moral disorders, in and borses and cattle could obtain abundant neatureme during the system. continence, for instance, and the in-cipient stages of the alcoholic habit. It would be a remedy adprincipum, curing the symptoms by removing the cause, for some of the besetting vices of youth can with certainty be ascribed to an excess of that potential energy which finds no outlet in the functions of our meden. tary mode of life. In large cities parfrequent opportunity of active exercise, as we owe them anticoptic diet in a mala-rious climate. - Dr. Felix L. Osweld, in Popular Science Monthly.

John Griscon, who undertook to fast 45 days at Chicago, shows a lose of 12 pounds after 72 hours' fasting.

The receipts at Halifax (N.S.) Unstone House during May amounted to \$115,609, an increase over receipts in May, 1880, of \$23,504. Inlend Revenue receipts amounted to \$20,861, an Inorease

It is stated in Chicago that there is sharp war between Vanderbilt and the Lake Shore and the New York Central on one side, and Gould with the Wabash and system on the other. The aggressor was Gould, who withlies the easura freight Gould, who with rew the case or a reignt from Yazderbill's lines and sent it over other roads to Unicago. Vanderbilt retaliated by sending freight for southwestern polate via Bloomington, Unicago and Alton, as chief gamer by the fight.

cided in the Court of Chancery, at Belleville yesterday. It was that of the wife of David Robbin. of Sidney, to whom he was married 17 years ago, but with whom he had not lived. The parties were married by a Justice of the Frace in the United States, and defendant alleged that a conspirate you the best of the woman. a conspiracy on the part of the woman and her friends, who had, he stated, got him drunk, and had the ceremony performed when he was in that condition.

A baille went to serve write on the prodelitie west to serve write on the pro-perty of Hutchins, near Mallow, county Uork, on Saturday. Some women seix-d him, destroyed the write, stripped him haked and threw blue into the river. They caught him as be came out and thrashed bim with furze. The man, more dead than alive, was then tarred, feathered and hunted out of the county. A large party of police went from Mallow to res-cue him, but was unable to find him. Riaborate preparations are seing made to recew the attempt to carry out New Pallas erictions.

Mr. A. Larmer, of Montreal, Is making extensive shipments of phosphate from this section, his works being under the superlutendence of Mr. G. S. Poters of Kingston. Mr. Larmer has purchased from the mine in Templeton, owned by Mr. Mark Haldene, of Aylmer, 600 tons, which is being shipped from Ironsides

to Montreal, 200 tons of which left by barge on Tuesday. At East Temploton, chiefly purchased from the McLaren mines, Mr. Larmor has nearly 2,000 tons, part of which will be shipped east and turt west to Chiosgo. Last week Mr. Larmer ablipped to the latter port 500 tons by the schooner Pends of Amer-The finest quality of the phoephato goes to Europe, where it mands the highest price, and the No. 2 is shipped to the west, 'lie best quality of the ore is now worth \$16.59 per

#### MISCELLANEOUS.

TELEGRAPH LINES IN THE

NORTH WEST

We R S Tupper, inspector of Government elegraph lines, has returned to the city from an official trip to the Rocky Montains

The St. Paul Pioner Press contains the following information concerning his movements.

"Mr R S Tupper, inspector of felegraph lines has returned to the city from an official trip to the Rocky Montains

The St. Paul Pioner Press contains the following information concerning his movements.

"Mr R S Tupper, inspector of felegraph lines for the floorroment of Canada, who has just returned from one of his graph lines for the floorroment of Canada, who has just returned from one of his graph lines for the floorroment of the great Korth West. The Hominton Oovernment operates a line of felegraph entirely distinct from that of the Ganadian Pacific Railway. From Thunders they district from that of the Ganadian Pacific Railway. From Thunders they district from that of the Ganadian Pacific Railway. From Thunders they district from that of the Ganadian Pacific Railway. From Thunders the double purpose of effective competition, and of keeping up a communication with the districts settled, but not having the davantages of railroads This line is a linearly constricted to Edmonton, a point of the wast country which he believes is designated to be the future garden of America. Ris journey of 122 days was performed in the severest part of the winter the thermometer reaching as to was fifty-two degrees below zero. Yet he profits no suffering from the cold and the proprise of the streams the restrictions of the winter the thermometer reaching as the same upon papealed to the Control of the winter the thermometer reaching as the province of the streams the restriction of the winter the thermometer reaching as the province of the streams the restrictions of the winter the thermometer reaching as the same upon papealed to the Control of the winter the thermometer reaching as the province of the stream of the province of the stream of the province of the stream and improvement and bodily welfare, and a chief condition of permanent health. Like manistic attends and female purity, gymnastics and temperance should go hand in hand. An effeminate man is half sick; without the stimulus of physical exercise, the complex organism of the human body is liable to disorders which abstinence and charify can only partly counteract. By increasing the action of the circulatory system, athletic sports promote the elimination of effect matter and quicken all the vital processes till languor and dyspepsis disappear like rust from a busy ploughshare "When I reflect on the convenience in spending the nights" no inconvenience in spending the nights in his tent. The stretch of country west-ward to the Rockies is not to be judged by Manitoba Lake, that the soil is deep and stantoba Lake, that the soil is deep and rich, but the country is rolling prairie with occasional higher elevation. Open country and timber land alternate, the largest prairie in the whole reach being but thirty miles wide. The whole is abundantly watered. The Upper and Lower Saekatchewan, rising within a few miles of seeh other diseases. as exceedingly tertile and blessed with a climate which differs from that of the abundant pasturage during the e-verest weather. In the most sparrely settled portions you travel not more than seventy. five miles, without coming upon babita-tions. Edmonton is a settlement number-ing from 2,000 to 3 000, situated on the ing from 2,000 to 3 000, situated on the upper Saskatchewar on the third and last step of the prairie, as it ascends to the footbills of the mountain range. It is described as a busy little town where the telegreph receipts last year were \$800. It is on the proposed line of the Canadian Pacific, but the most interesting point about it is that in this vicinity is an immense cotlifield. This promises to be of the highest importance to the whole North West, as an essential factor in rapid development. Mr. Tupper brought back with him a specimen of this coal. It is lignite of a purity rarely seen. Very laint traces of sulpher can be detected in it, and with him a specimen of this coal. It is ligate of a purity rarely seen. Very faint traces of sulphur can be detected in it, and its beating qualities are said to be little inferior to antiractive. It is of the same class as the Souris coal, near the line of the Northern Pacific, which was tested with anoh satisfactory results at Paterson, N.J. This specimen was taken from an outcrouping ledge, but over an area of 200 outcropping ledge, but over an area of 200 miles square the principal streams cut coal velos. This would indicate a supply sufveios. This would indicate a supply sufficient for centuries. It is possible that the resources and attractions of this reand attractions of this region are overrated by enthusiasm and
patriotism; but there seems to be no reason to doubt that here, in the heart of the
continent, are waiting homes for millions,
and thousands of square miles of most
productive soil. To us of the North West
this cannot fail to be interesting, promuslug, at it does, with the completion of the Canadian Pacific, the birth of a new do-minion, whose wealth and commerce will be but an extension of our own.

#### THE RIVERS, STREAMS AND CREEKS BILL

The following is the text of report of the late Minister of Justice recommending the disallowance of an Ontario Act of last session :-

ing the disallowance of an Ontario Act of last session:—

"Application for the disallowance of this Act has been made by Mr. I'ster Molaren, of the town of Perth, Jumber menufacturer, mithe grown in exceed that the Act in queetion deprives him of vected private rights without compensation, and practically reverse the decision of the Court of Chancery in a case brought by him against eace Caldwell, whereby Mr. Molaren's exclusive right to the use of improvements erected by him or ibore through whom he claims on certain streams in the Province of Untario was established by a decree of the court.

The Act by its first section declares that all persons have, and always hive had, dering the spring, summer, and astumn freshets the right to float and transit saw logs, &c., down all rivers, creeke, and streams, in respect of which the Legisfature of Ostario has nationity to give this power, and in case it may be necessary to remove any obstruction from such piver, creek, er attemm, or construct any apron, dare, Ac., becomeny to facilitate the floating of saw logs, &c., down the same, it chaif be lawful for the person requiring for find down the awloss, de., down the same, it chaif be lawful for the person requiring for find down the awloss, de., to remove such obstruction, and to construct such appears shall not have the exclusive right to the use or control thereof; but all persons shall have a right to use them, subject to the payment to the person who has made such constructions and improvements of reases-able toits.

The claim tection extends the operations of sections uneand cut of all persons ability of such tiver, greeke, or affection and affections of sections and the constructions and improvements of reases-able toits.

The fourth section empowers the Lieuter autotionernor in-Council to fix the amount which any person entitled to fully under the Act shall be at livery to charge on say for-

Had the Act, instead of giving to any person desiring to make use of the streams the right to use the same upon parment of certain tolia absolutely expropriated the whole ownership of the streams for the public use, and provided a means for compensating the owners for the property so taken from them, it would be less objectionable in its faalures.

owners for the property so taken from them, it would be less objectionable in its features.

The effect of the set as it now stards seems to be to take away. The seems to be to take away. The effect of the set as it now stards seems to be to take away. The seems to be to take away. The seems to be to take away it it to another, as few it is and of his rishls.

I think the power of the Local Legislature to take away the rights of one man and vect them in another, as is done by this Act, it exceedingly doubtful, but assoming that such powers are not exercised in flagration to interfering with the private rights and national justice, especially when, as in this case, in addition to interfering with the private rights in the way alluded to, the Act overrides a decipion of a court of competent plants the law always was and is different from that laid down by the cast.

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portion.

On the whole I think the Act should be disallowed f recommend, therefore, that the Act passed by the Legislature of Ontarion tile last seesien, initiated: Ab. Act for Protecting the Public Interests in Rivers, Streams and Crocks, be disallowed.

#### RAILWAY MEETING AT LAN. **UASTER**

Lancaster, 30th.—The meeting of the Directors of the Uanada and Atlantic Directors of the Canada and Atlantic Railway took place this afternoon. Presant—R. McGillivray, President: A. McNabb and W. G. Perley, Vice-Presidents; Mayor Mackintosb, J. R. Booth, R. S. McDonald, Hom. D. A. Meddonald, O. O. Noble, A. O. Helmer, P. Kennedy, D. A. McArther, Duncan A. McDonald, J. Frasen. The Directors absent were Mears. J. S. Castleman and John Rankin. Renkus

The President submitted a report stating that satisfactory bonds had been secured from the contractor, Mr. Linsley, and that

the work was progressing favourably, and that it has work was progressing favourably, a Committee was appointed to audit to accounts, which were passed.

The Secretary, Mr. Macdougall, who that it resigned, received \$1,200 for bit two wars services, and \$1,000 were paid to Mr. Tillany for lagal services.

At a mosting of the shareholders Mesers it the loss, and were replaced to by Mesers Pattern and and were replaced to by Mesers Pattern and

A lengthy discussion ensued, Hon. D.
A. Macdonald expressing his opinion that action aboutd be postponed. Mr. Mackapinos said that three mouths ago when the by-law was first introduced those who now asked for postponement expressed their willingness to have it settled at the regular annual meeting. This being so, be saw no reason for a change of base

Sobsequently the by-law was read and adopted.
The following officers were then elected:—President, R. McGillivray; VicePresident, A. McNab; Secretary-Treasurer,
K. H. Tiffany; Solicitor, E. H. Tiffany;
Auditors, James Lindsay, of Ottawa, and
John Simpson, of Alexandria,
After the trensaction of some position

After the transaction of some routine business the Board adjourned.

# PURE SHORTHORNS.

At a meeting of cattle-breeders of Toronto, held on Monday, the following resolutions were adopted;—"Whereas the breeding of pure shorthorns has be-come an interest of Canada, and whereas such interest would be best advanced through an organization of breeders, and whereas it is desirable that a public record of pedigross of shorthorns should bu kept, having a standard unt lower than that adopted in the United States and England, therefore resolved, that in the opinion of this mosting such organization should be formed with as little dulay as possible, having for its object the publication of a hard-book, and for any other purpose decined in the interest of brorders of aborthorns; second, that in order to carry out the above view, the chairman and scoretary of this mention be feature to leave a circular cilling a larger mosting at the Walker House able tol's.

The third section extends the operations of rections one and two tends of rections one and two tends of rections one and two tends on the first rection and to bleed the rection and to bleed the rection and to formation of such society, to consider the land through which it runs, belongs to the Crown er act.