

The Use of Turbine Engines.

At a meeting of the Institution of Engineers and Shipbuilders in Scotland, held at Glasgow, the Hon. A. Parsons read a paper on the 'Marine Steam Turbine, and Its Application to Fast Vessels.' After giving a short history of the development of the steam turbine Mr. Parsons referred to the two torpedo destroyers built for the Admiralty, the Viper and the Cobra.

He said the Viper had passed all her official trials and had fulfilled all the guarantees of her contract. As regards speed, she had exceeded the thirty one knots guaranteed by over five knots, and as regards the guarantee of 2.5 pounds of coal per indicated horse power at thirty one knots she easily obtained a consumption of 2.38 pounds. The Cobra had duplicate machinery to the Viper, and was now the second fastest vessel afloat. As to the future, though for obvious reasons up till the present time turbines had only been fitted in vessels designed for phenomena speeds, yet it must not on this account be assumed that they are only applicable to such vessels. The two conditions of suitability are that the vessel shall have a moderately large size. For slow vessels of moderate and small size the conditions for turbine machinery are not at the present time so advantageous. The class of vessels that were most suitable for the application of turbine machinery are the following: Pleasure steamers, passenger and cross channel steamers, liners (including Atlantic liners of the largest size), also all fast war vessels such as torpedo boats, destroyers, cruisers of all sizes, protected cruisers, and all battle ships of the usual speed.

Proceeding to consider some of the applications of the steam turbine more in detail, Mr. Parsons took first the vessel now building by Messrs. W. Denny & Bros. of Dumbarton for the Fairlie Campbelltown service, which it was hoped would be ready by July 1. Her dimensions are: Length, 250 feet by 30 feet beam, by 10 feet 6 inches moulded to main deck, and 17 feet 9 inches moulded to promenade deck. Her general arrangements are some what similar to those of the usual modern type of river or coasting pleasure steamer, but slight modifications have been introduced to suit turbine machinery. The machinery consists of three separate turbines driving three screws afts. The high pressure turbine is placed on the centre shaft and the two low pressure turbines each drive one of the lower shafts. Inside the exhaust ends of each of the latter are placed two eastern turbines, which are in one of the low pressure motors and operate by reversing the direction of rotation of the low pressure motors and outside shafts.

In ordinary ahead going the steam from the boilers is admitted to the high pressure turbine, and after expanding it about 5 fold passes to the low pressure turbines, and is again expanded in them about another 25 fold, and then passes to the condensers, the total expansion ratio being from 125-fold, as compared with from 8 to 16-fold usual in triple expansion reciprocating engines. At 20 knots the speed of revolutions of the centre shaft will be 700 and of the two outer shafts 1,000 per minute. When coming alongside a jetty or manoeuvring in or out of harbor the outer shafts only are used, and the steam is admitted by suitable valves directly into the low pressure motors, or into the reversing motors for going ahead or astern, on each side of the vessel. The high pressure turbine under these circumstances revolves idly, its steam admission valve being closed and its connection with the low pressure turbines being also closed by non return valves. By this arrangement great manoeuvring power is obtained and though similar to that adopted in the Viper and Cobra it has some distinctive advantages, especially as regards the reversal of the order instead of the inner shafts, yet it should be stated that the officers in charge of the Viper have described her as an extremely handy vessel of her class.

The main air pumps are compound and worked by worm gearing from the main engines in the usual way. There are also small auxiliary air pumps worked from the circulating engines for draining the condensers before starting. The other auxiliary machinery, is as usual in vessels with reciprocating engines, and includes a feed-heater fed from the exhaust steam of the auxiliaries, and also when necessary by steam drawn from an intermediate point in the expansion of the main turbines. The boiler is of the usual double-ended Scotch pattern. The speed of the vessel

is expected to surpass that of any similar boat at present on the Clyde.

In vessels of the mercantile marine of moderate fast speed it was of more importance to obtain economy in coal consumption than to reduce the weight of the engines and condensers to their lowest limit, as was usually done in torpedo boat destroyers, where the boilers were extremely light and heavily pressed, and the highest possible speed was the first consideration. For the mercantile, therefore it became desirable to design the turbines for the greatest possible economy in steam; consequently the ratio of expansion extended over nearly the whole range between the boiler pressure and that in the condenser; the condensers were also of ample size, so as to maintain a good vacuum and an efficient feed-heating arrangement was provided to warm and heat the feed.

Of a very different type from Turbinia, Viper or Cobra is the Discovery, which is to be launched from the Pannure shipyard at Dundee on March 21. The Discovery is the second vessel of the name launched from the Pannure yard, but whereas the former was made for a voyage to the North Pole, the new Discovery is destined for the South. She is unique because no other British ship has ever been built in this way specially for Antarctic exploration. In the first place, this boat, which is costing £50,000, and from the scientific and practical points of view, is worth every penny of it, is made entirely of wood, while a necessary condition of her construction was that she should be far stronger than any ordinary navigating boat, and should be able to withstand extraordinary pressures from ice that would crush up a common trading vessel like a matchbox.

Iron was barred for the simple reason that in the very forefront of the expedition's programme is magnetic survey work of a most important description, as the result of which it is trusted that navigation in the far Southern seas will in the future be much assisted. It is certain that at present iron ships in these waters sail many miles out of their way, and an iron exploration ship would be useless for such work. The magnetic pole must be wooed by a wooden craft. Geographical discovery and geological and biological investigation are also important among the expedition's objects, but to the commercial mind it is probable that the one first named will appeal with the most force.

There was, then, a problem presented in which a ship was to be made of wood, and so made that she would be stronger and safer than any sheathed in iron plates, and it has been very satisfactorily solved. Nine feet of solid oak in the Discovery's stem provide the solution in the all-important fore quarters, and the sides all the way round are two feet six in thickness, of oak also—not ordinary oak, but grand stuff grown in Scotland, and picked with care for its very special purpose. Bulkheads of unusual strength stretch across from side to side, so that when the terrible ice pressure is at its worst the defence may be positively all that is possible in wood.

The Discovery is built so that when the ice pack closes in on her she will rise and lift herself away. Her rudder and screw propeller are threatened, both can be hauled on deck as if they were mere sounding leads. She has air locks between her exterior, so that those who enter and leave her will not disturb the cherry warm atmosphere that comforts those within. And she has cabins and workrooms and laboratories and wonderful store rooms of such capacity that food for forty years will be stowed away inside them.

In command of the ship is Capt. R. F. Scott, R. N. late of the Majestic, who has since last autumn been working energetically. With Capt. Scott are associated Lieut. Armitage, lent by the P. & O., and Lieut. Charles Royd, and Mr. R. Skelton as engineer. Two other officers are yet to be appointed on this side of the expedition.

On the scientific side Prof. Gregory of Melbourne, who is director of the civilian scientific staff, is at the top. Professor of Geology at the Melbourne University, which lends him to the expedition, he is a man of high repute, and well adapted for his work. He is already having a hut built at Melbourne in case any considerable work on land is attempted, as is very likely. The professor would, of course, be in charge of any such landing party, and would probably take with him Dr. Wilson, Mr. Shackleton and five men. The last named is the physicist, Mr. Hodgson is the biologist, Dr. Koettlitz is another medical man, and there you have a well chosen

scientific department. Mr. George Murray of the British Museum is acting as Prof. Gregory's deputy in England and will accompany the ship to Melbourne.

With the Discovery will sail next August a German companion now being built at the Howaldt works at Kiel. The German boat is built on the same principles as the British. But she is light and more like the Fram.

Both boats will carry with them captive balloon equipments and plenty of dogs. Of the latter the Kaiser's ship will have fifty kennels on board, while the Britisher will take twenty Samoyedes, which are being specially chosen and sent from Russia. It is just a possibility, if certain difficulties can be overcome, that the expectation may seek to avail itself of wireless telegraphy, for Capt. Scott is highly skilled in this respect and has had charge of such arrangements in Channel Squadron manoeuvres.

The original plan was for three years' absence. For this the German boat is fully prepared. The Discovery, however, is still £29,000 short of the money needed for the full period. As it is, food is being taken for three years, but it is impossible on the money already promised to pay men's wages for more than two, and therefore equally impossible at present to make definite arrangements for a longer period.

DUELLING IN GERMANY.

Reichstag Discusses the Attempt to Stop the Practice in the Army.

A Berlin correspondent gives the following report of a debate in the Reichstag on the second reading of the estimates for the army, when Herr Grober of the Centre or Clerical party again raised the question of duelling in the army. He referred especially to the incident at Cologne, where candidates for the position of officers in the reserve were questioned as to their views on duelling, and were rejected if they belonged to students' societies in the statutes of which the practice was condemned. He asked what steps had been taken by the Government in consequence of the action of the district commander and the council of honor who had disregarded the express orders of the Emperor on this subject.

Herr Grober went on to discuss the disgraceful incident at Mörchingen, where Lieut. Ruger had murdered Capt. Adams in order to save his brother from the dangers of a duel. This tragedy was a consequence of the mistaken views which prevailed in the army with regard to duelling. The clerical spokesman contended that in this case, as in the incident at Cologne, there had been a breach of the stipulations which had been issued by the emperor prescribing the course which was to be followed in such cases. He contended that the national sense of justice would suffer severely if officers were practically ordered to indulge in a practice forbidden to all other classes.

Gen. Von Goosler, the minister of war, replied to Herr Grober. He informed the house that the persons had been punished who in the incident of Cologne had been guilty of a breach of the existing regulations. The attention of all who were concerned in the election had been directed to the Imperial order forbidding questions to be put to candidates with regard to their views on duelling. The minister declined to discuss the Mörchingen tragedy, which was still before the military courts, as Lieut. Ruger had appealed against his sentence. He pointed out, however, that it was scarcely possible to conceive a more serious insult than one which took the form of physical violence. He thought that many of those who discussed the practice of duelling were not aware of the difficult nature of the question. He gave an historical review of the attitude of the military authorities toward the practice, and showed that a great improvement had been effected. The state of affairs in the army had formerly been intolerable, but an end had been put to this by the authorities, who had devoted their efforts to diminishing the number of duels.

The Minister read a report by Gen. Von der Grieben, whom he described as absolutely free from prejudice, who declared that duels were justifiable in cases where the challenger had been accused of cowardice, where he had been insulted by an act of violence, or where his moral integrity or that of his family had been impugned. The report went on to say that every thing that was possible had been done to prevent the so called 'duelling abuse,' and that there was no occasion to take any fresh action in the matter. Gen. Von Goosler concluded his speech by declaring himself in complete accord with the views of Gen. der Grieben.

The discussion was continued by the socialist leader, Herr Bebel, who maintained that his Majesty's Cabinet order regulating the practice of duelling was in direct opposition to the law of the land. The order recognized the practice in principle, instead of condemning it. It ought

to have been laid down that every one who took part in a duel should be punished in accordance with law, and, most important of all, that he should serve his full term of imprisonment, and not be pardoned after he had suffered a small fraction of his punishment.

The German nation was so penetrated with the idea of the equality of all persons before the law that it could not endure that any class should arrogate to itself a separate code of honor. Herr Bebel went on to complain that the proceedings before the court martial with regard to the tragedy at Mörchingen had been in camera. Gen. Von Goosler had said that a duel was necessary in such a case as had occurred at Mörchingen, but a similar incident had taken place between officers belonging to the Sixth Army Corps. On that occasion the court of honor had declared that an apology was sufficient, as the officer was insulted the other had been drunk at the time. The Reichstag ought to protest against the view of the Minister of War and to make it clear that no one had a right to set himself above the law. The commander-in-chief ought to decree that every officer who was punished for taking part in a duel should be summarily dismissed from the army. The subject was then allowed to drop.

The Gum-Chewing Cow.

A farmer in Knox County, Maine, has been saying mean things about a Rockland shipmaster, and Opinion reports a few. Quoth the farmer: 'If I had a hired man that made such a piece of work as he did about that cow of his, I'd send him off!

'Why, he bought a cow of a man down my way; good critter—nothin' the matter with her. But it seems the captain's wife, one day, thought the milk tasted funny, and suggested, that p'raps she'd been eatin' spruce boughs; said the milk tasted like spruce. And what does he do but go out in the pasture to watch the cow, to see what she did eat.

'The cow was layin' down, chewin' her cud, and he went along and run his finger in her mouth to see what she was eating. Then he was mad. He put a rope on the cow, and started off with her.

'Where are you goin' with the cow?' says a neighbor.

'Goin' to take her back to the feller that sold her to me. He's cheated me and I won't stand it!

'The man wanted to know what was the matter, and he went on to tell about it. She wasn't eatin' boughs,' he says, 'she was chewing gum; that's what the matter with the milk and makes it taste like spruce. And,' he says, 'that ain't all. She's so addicted to the habit that she's worn all her teeth out. She ain't got an upper tooth in her head. Back she goes quick!

'Of course the man told him that it was all nonsense; that cows never had no upper teeth. But he didn't believe a word of it, and went on and had a tawny row with the man that sold him the cow. Guess he was never satisfied about it.'

They Eat Themselves.

From various causes, such as anger and fear, many animals eat their own flesh. Rats, when caught in a trap by the leg, will gnaw off the captured member, and mice in captivity have been known to bite off their tails. But there are some creatures which go much further and actually eat parts of themselves if left for too long a period without food.

A hyena belonging to a menagerie was kept by the proprietor without food in order to tame it. One morning he was horrified to find that the ferocious creature had actually eaten part of its own leg.

An eagle in the zoo a few years ago was noted for the fact that it would now and then pick pieces of flesh out of its own legs and eat them.

Certain caterpillars and toads devour their cast off skin. This may be due to fear, but it looks like economy.

There is just a trace of this characteristic in human beings. Children when in rage sometimes bite their own hands and arms, although it must be admitted that they desist when it begins to hurt.

One Way of Getting Even.

'There is a fellow in our office who is a chronic borrower,' said a young man employed in a large Market street establishment.

DON'T BECOME AN OBJECT

Of Aversion and Pity, Cure Your Catarrh, Purify Your Breath and Stop the Offensive Discharge.

R. v. Dr. Bochor, of Buffalo, says: 'My wife and I were both troubled with distressing Catarrh, but we have enjoyed freedom from this aggravating malady since the day we first used Dr. Agnew's Catarrh Powder. Its action was instantaneous, giving the most grateful relief within ten minutes after first application.' 50 cents. 2

ment recently. 'He got into nearly everybody in the place before we all made up our minds to stop lending. He has owed me \$2 for nearly a year, but I'm nearly square, although he has never paid me a penny of it. That sounds queer, but it is the truth. I'll tell you how I've worked it.

Every once in a while one of the fellows will say, 'I'm going to make So-and-so give me what he owes me next pay day or know the reason why.' That's my chance, and I casually remark, 'I'll bet you a quarter you don't get it.' Usually the fellow takes me up, and when pay day comes he loses his bet, for So-and-so never pays. In small bets of quarters and dimes, luncheons and cigars I have nearly got back the amount I originally loaned to the chronic borrower.'

Was Ready to Compromise.

A very small pile of coal on the sidewalk in front of a house on A street southeast. A correspondingly small son of Ham was sauntering along and seeing it scented a job. He rang the doorbell.

'Am dat yo' all's coal?' he asked the lady at the door.

'Yes.'

'Wanted it toted in?'

'Yes.'

'Kain't I git de job?'

'Why you're pretty small, and then you might charge too much. You might ask more than I could pay.'

'How much is you got?' asked the small man of business. 'Kin yo' raise a dollah?'

'Oh my goodness, no!'

'Seventy-five cents?'

'No, no; run along and don't bother me.'

And she started to close the door.

'Mebbe so yo'll gib 50 cents.'

'No, no; run along.'

'I reckons yo' all ain't got er quartah?'

'No.'

'Ner a dime?'

'No, not even a dime,' replied the woman, beginning to laugh.

'Well, how much is yo' got?' questioned Hem showing his ivory. 'I sut'nly does want er git de job.'

'I've got just a nickel.'

'Well, I'm jus' a-lookin fer nickel jobs.'

And he straightway began.

Distinction, not Difference.

A group of small boys, gathered under a big oak, had listened spellbound for an hour to Uncle Enoch's tales of adventure by land and by sea, on the field of battle and in the trackless forest.

At last the hero of all the adventures paused for breath, and one of his listeners ventured a single gasping question.

'Uncle,' he stammered, 'I s'pose—I s'pose you never ran away from anything all your life, did you? Not from bears nor tigers nor canons nor wild Indians, nor—nor anything?'

Uncle Enoch pulled his spectacles well down on his long nose, and gazed benignly over them at his venturesome young person.

'Benny,' he said, in a tone of one safely arrived at the seat of wisdom, 'you live long enough an' you'll find out 'taint ever best to run away from danger, no matter what; but you'll see times when you'll change front and advance in the other direction 'bout as fast as you can go.'

It Came in Handy.

Poet—I left a poem here the other day. Do you think you can use it?

Editor—I have already. It came in so handy, I simply had to.

Poet (gasping joyfully)—Ah!

Editor—While I was writing my last editorial I ran out of copy paper; your poem, being written on one side of the paper only, just helped me out.

Hinged on the Cows.

The London Outlook speaks of a lover with an agricultural cast in his eye which boded ill for his lass.

He was a dairyman who owned thirty or forty cows. He was arranging with the minister about his wedding, and was bidden to name the hour.

'Well, sir,' he replied, 'I cannot say just to an hour or so. There's the cows, y' see; but I'll be there as soon as ever I can.'

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A Triumph of Photography.

Of course it was a Missourian, one of the 'you've got to show me' type, who remarked to a companion as they examined with awestruck interest a picture in which there was seen the faces of all the presidents of the United States. 'Say, Bill, how in thunder did the photograph man ever get them men all together at once?'

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