NEW METHOD OF TESTING WELDS.

A new method of testing welds was presented by Mr. C. Fremont, of Paris, in a paper read before the Congress of the International Association for Testing Materials. An abstract of the paper follows:

The impact test was selected to determine the strength of forged welds in order to ascertain the limits between which this strength is likely to vary. Small prismatic test pieces, measuring 8 x 10 mm. in cross-section, were employed. These pieces were left unpicked. The unit of comparison was the strength of the original metal. The welds were made in fairly large numbers in France and elsewhere by smiths, specially on account of their skill. The welds —steel on steel, iron on steel, and iron on iron—were of the scarf-jointed type, so as to obtain large contact surfaces. Each piece welded was of square section and about 35 mm. on the side. Macrographic etchings of the welds in all cases showed a line of demarcation between the two metals at the seat of the welds, the portions in contact not having interpenetrated.

The square section iron employed in these various welds had a tensile strength of from 35 to 40 kg. per square millimeter and the mild steel a tensile strength of about 40 kg. per square millimeter. The impact test on the unnicked test prisms 8 x 10 mm. in section gave about 50 kilograms in the case of the steels, the test pieces not exhibiting fissures in any instance, and from 26 to 32 kilograms for the iron, the fracture of the metal being fibrous. Prismatic test pieces similar to the foregoing were prepared from the welded pieces, but in such a way that the bending test could be applied in line with the welds to enable the strength of the latter to be determined. Under the impact test all these pieces exhibited in all cases a strength inferior to that of the natural metal. In most of the tests the test pieces fractured in consequence of the weld opening, the strength being insignificant, less than 1 kilogrameter. Among the better results the steel-steel test pieces underwent a fair amount of deformation before fracturing, the force required being from 15 to 16 kilogrameters; that is to say, only one-third of the strength of the original metal, which could be bent right over without breaking or even cracking.

The static strength obtained in the testing forged scarf jointed welds is equal to the static strength of the metal only when the welded surface is sufficiently large to compensate for the lower elementary strength per unit surface, just as in a brazed joint.

Autogenous welds are still weaker than forged welds, not only because of the smaller surfaces of adhesion they present, but also on account of the lack of continuity in the added metal and of not being hammered.

SUBSTITUTE FOR BRIDGES IN SASKATCHEWAN.

Owing to the great width of the North and South Saskatchewan Rivers, the cost of bridging them is very high, and in order to provide the settlers with access to their markets the Government maintains an ever increasing number of ferries accross these streams.

In 1905, at the inauguration of the province, there were twenty-two government ferries. There are now thirty-three, and by the end of this season there will be five more, all of them being under construction, and some of them almost finished at the present time. Three of these new ferries will be on the South Saskatchewan, namely, north of Pennant, north of Cabri, and south of Owensville postoffice in range 21, west of the third meridian. Two will be on the North Saskatchewan, one west of Hepburn, and the other south of Frenchman's Butte.

SYNTHETIC AMMONIA PROCESS.

An announcement of special interest in New York by Professor Hofrat Bernthsen, an eminent German scientist, lecturing in the Eighth International Chemical Congress. He explained that a system has been discovered in Germany for the synthetic manufacture of ammonia, by the uniting of nitrogen and hydrogen. The ammonia is prepared by passing the gases through a tube containing a substance for promoting reaction at a temperature of about 900 degrees Fahrenheit, and under a pressure.

As ammonia is extensively used in the manufacture of ice and in the preparation of fertilizers, notably ammonium sulphate, Dr. Bernthsen predicted that its synthetic preparation was an important step forward, inasmuch as its components—nitrogen and hydrogen—may be obtained from water and air respectively, at a negligible cost. The world's consumption of ammonia for 1911 was estimated in value at $80,000,000.

MINERAL PRODUCTION IN BRITISH COLUMBIA

Copper is the only mineral showing an increased production in British Columbia. Lead and zinc show decreases, while iron is a negative quantity in the preliminary review for 1911, compiled by the provincial mineralogist, Mr. W. Flett Robertson.

A considerable falling off in the production of lead is shown, the average price of which for 1911 was practically the same as for 1910. The most serious decrease was in the output of the St. Eugene mine; this amounted to more than 8,000,000 pounds. The Sullivan increased its output between 2,000,000 and 3,000,000 pounds, and to that extent reduced the decrease in quantity from East Kootenay mines as compared with 1910. Approximate figures of production for 1911 are: St. Eugene, 6,000,000 pounds; Sullivan, 11,000,000 pounds. Ainsworth Division mines produced but little lead in 1911, whereas in 1910 they contributed about 2,500,000 pounds to the total for that year, the three shippers having then been the Bluebell, Highland, and Whitewater group. The 1911 total from all properties in Ainsworth Division is estimated at less than 300,000 pounds. Slocan maintained its output, the total from the Richmond-Eureka, Ruth-Hope, and Rambler-Cariboo, and that from the Slocan Lake section—Van Roi, Standard, and Hewitt-Lorna Doone —having together been somewhat higher than the corresponding figures for 1910. Nelson Division had the Emerald and Molly Gibson mines as its chief producers of lead. There was a relatively small production from the Lardeau District, and still smaller from Portland Canal.

A statement published last autumn showed the total expenditure by the Dominion of bounty on lead to July 1st, 1911—that is, for eight years—to have been $1,617,020. Of this sum, $249,370 was paid in the fiscal year ended March 31st, 1911, and $49,714 for three months to July 1st, 1911. After deduction of $50,000 appropriated for zinc-ore reduction experiments, there remained, as at July 1st, 1911, of the $2,500,000 originally voted an unexpended balance of $832,980.

The estimated increase in the copper production of the Province, as compared with 1910, is about 1,200,000 pounds.

The Boundary District made a decreased production in 1911 by about 6,500,000 pounds (the reason for which has been already explained), and West Kootenay (chiefly Nelson Division) also shows a decrease of about 300,000 pounds; but against these decreases is to be placed an increase of about 8,000,000 pounds in the Coast District. The more