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PATENT No. 188438/22

PATENT NO. 345562/31

## FILE

STYLE F. QUALITY W.

FOOLSCAP SIZE

CHATTERLEY WHITFIELD

METHANE MONITORING TRIAL

3S YARD

JUNE-JULY 1966

NATIONAL COAL BOARD WEST MIDLANDS DIVISION NO. 1 (NORTH STAFFS.) AREA

CHATTERLEY WHITFIELD COLLIERY

## DATA RELATING TO FIREDAMP EMISSION MEASUREMENTS

(Period of Measurement: from 14.6.66. to 30.6.66.

1. Seam Detail

Seam Name YARD Depth of Cover 380 yd.

Seam Thickness 33 in Thickness worked 33 yd.

2. Face Detail

Name 3's Yard Single Unit: Advancing

Face Length 200 yd. Direction of Cleat 70° from end on

Distance Face has Advanced 590 yd. (at commencement of investigation)

Gradient along Face 1 in 3.9 rise
(From intake to return end of face)

Gradient along Face Roadways 1 in 93 rise
(In direction of advance)

No. of Production Shifts/Day 2 Method of Loading Shearer Thickness of Web 2/9 in

Method of Face Support Dowty props 7/6 bars (pairs).

Method of Goaf Support Caved

Face Roadways Ripped

Headings in Advance of Face Intake 2' yd Return 2' yd

Coal Conveyed in Intake

3. Firedamp Drainage

Site of Boreholes Intake/Return

Length of Holes 72 - 95 ft Inclination 15° 50° from horizontal

Spacing 12 yards No. of Active Holes 9

Total quantity and Purity of Firedamp/Air Mixture Drained. (average for period of measurement) 127 cfm 55 % $CH_4$

Max. Suction Pressure applied to Boreholes 19.0" W.G.

Other Details

4. Output Details and Statutory Samples for Duration of Measurements and 4 weeks previously

| Week Ending | Face Advance (ft) | Coal Output | | Methane | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pithead (tons) | Saleable (tons) | Intake | | Return | | | |
| | | | | | | Inbye | | Outbye | |
| | | | | % | cfm | % | cfm | % | cfm |
| 7.5.66. | 47.25 | 2,992 | 2,796 | 0.03 | 3 | | | | |
| 14.5.66. | 54.0 | 3,240 | 3,163 | | | 0.66 | 68 | 1.50 | 160 |
| 21.5.66. | 58.5 | 3,705 | 3,345 | Nil | Nil | | | | |
| 28.5.66. | 44.0 | 2,779 | 2,491 | | | | | | |
| 11.6.66. | 47.25 | 2,992 | 2,560 | Nil | Nil | 0.40 | 39 | 1.22 | 117 |
| 18.6.66. | 56.25 | 3,563 | 3,270 | | | | | | |
| 25.6.66. | 56.25 | 3,563 | 3,253 | | | | | | |
| 2.7.66. | 47.25 | 2,993 | 2,712 | | | 0.67 | 71 | 1.15 | 125 |

5. An appraisal of the Exercise

Due to accessibility difficulties, the methanometer site was at the outbye end of the Return instead of at the prescribed point 50 yards from the Face. Methane content was, therefore, higher; two statutory samples taken at the 10 yard point were 0.73% and 0.9%, corresponding to a record of 1.65% and 1.7% on the lamp.

There is very little correlation between the operation of the shearer and methane content variations, but the methane build-up during the week is very apparent. The average methane content on successive Fridays was 1.5% and 1.8%, while on the Mondays following it was 1.0% and 1.2%.

The dropping of the ripping lips had a marked effect. The rips were dropped each day between 9.00 a.m. and 11.00 a.m. The times of only three are exactly known, and two of these are accompanied by the marked peaks 'C' and 'N'. Other peaks, such as 'J', 'T', 'X', may have originated through ripping disturbances.

Certain 'spike' peaks are noted, namely 'B', 'D', 'F', 'G', 'H', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', and some of these were definitely associated with the doors being opened in the supply and travelling split near the lamp. An observer was present at the time of peak 'D' and found that the district quantity dropped to 4,300 c.f.m., from an average of 8,000 c.f.m., for several minutes while supplies were passing through the doors. Again, the only happening in the district at the time of peak 'H' on Sunday afternoon was an examination tour by the Deputy. It is possible that the opening of the doors temporarily disturbs the pressure equilibrium in the district, bringing out a limited quantity of gas from the strata into the ventilation. It is also note-worthy that many of these types of peaks occurred at change of shift time. Others, however, are difficult to find any explanation for, from this loosely supervised trial.

The contribution of methane drainage is of considerable interest. Prior to the trial the boring programme had got behind schedule, and an effort was made to bring the number of holes up to complement during the survey period. The effort seems to have lowered the gas content in the ventilation from 137 c.f.m. to 121 c.f.m. pure methane, while the total gas quantity drained increased from 50 c.f.m. to 82 c.f.m. pure methane. There was, however, no dramatic reduction of gas content when a new hole was coupled to the range.

During the second week gas emission was particularly intense, compared with the routine statutory samples for this face. The cause is not apparent, but may be associated with the two weeks of sustained high output.

Ventilation quantity varied from 7,600 c.f.m. to 10,500 c.f.m. during the trial, while short term variations up to 10% were observed. This face is the most difficult to ventilate in this section of the mine, and the shortfall from the quantity which is ideally required is acknowledged, and is the basic cause of the elevated methane percentages. The sensitivity of the district quantity to transient restrictions and disturbances to the system (e.g. opening of doors) is adequately illustrated.

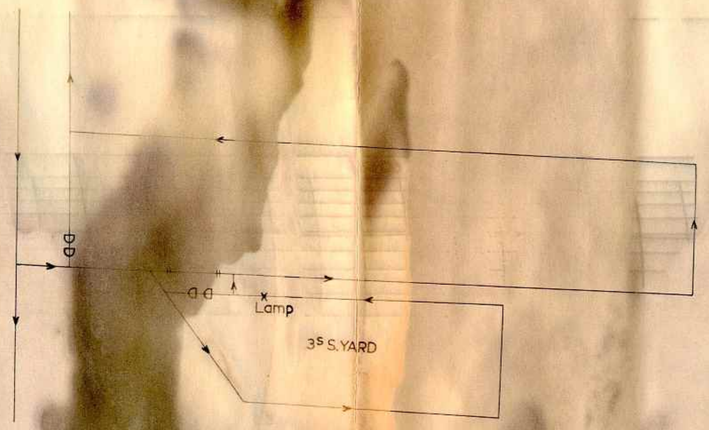
If conclusions were to be drawn from 3's Yard trial it would be that even on sophisticated mechanised faces the most important ventilation considerations are the traditional ones of adequate quantity, freedom from restrictions and short circuits and effective methane drainage. The additional problems introduced by the mechanised system and layout are localised, e.g. gas streaming from the caved waste return corner, or are transient disturbances which present a limited hazard.

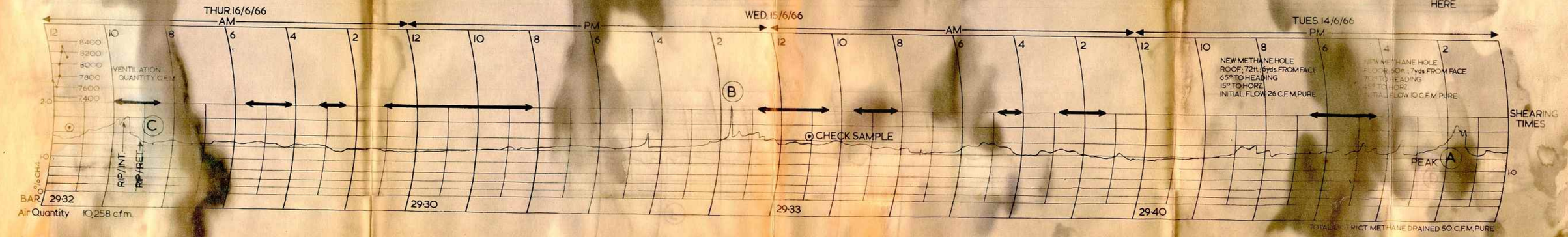
(G. V. Jolliffe)
Divisional Ventilation/Explosives Engineer

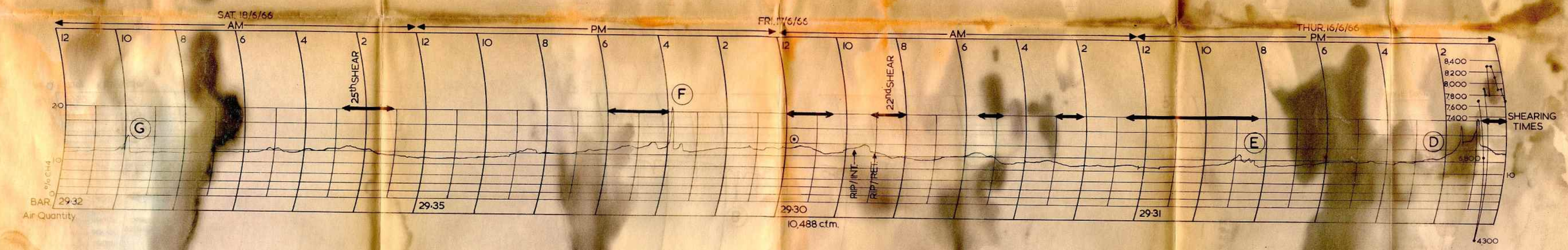
No.1

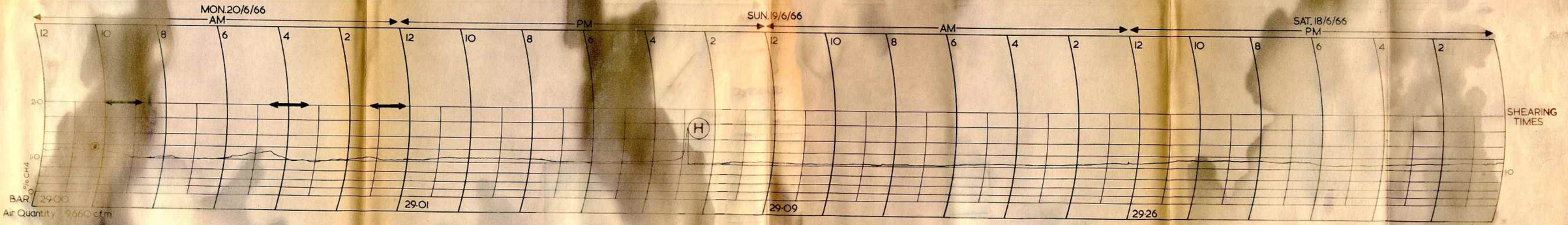
# CHATTERLEY WHITFIELD COLLIERY

## No.1 (N.STAFFS) AREA
## WEST MIDLANDS DIVISION
## METHANE MONITORING EXERCISE
## YARD 3$^{S}$ SOUTH DISTRICT



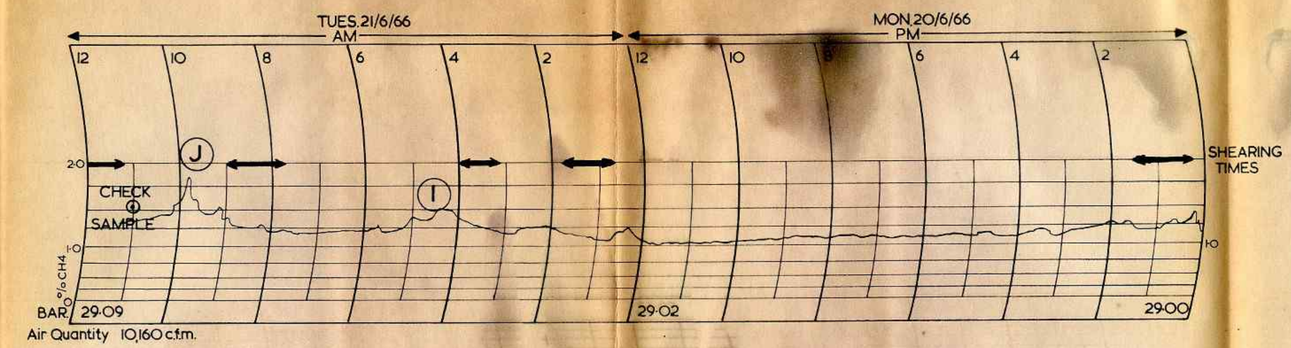



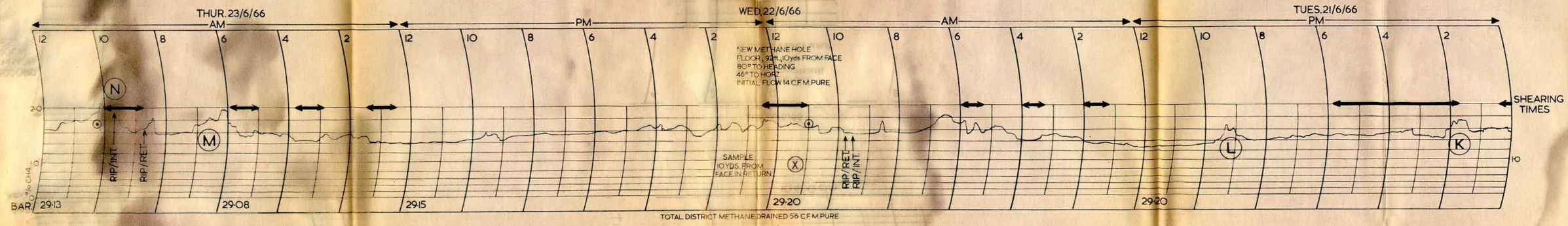
No. 2

# CHATTERLEY WHITFIELD COLLIERY

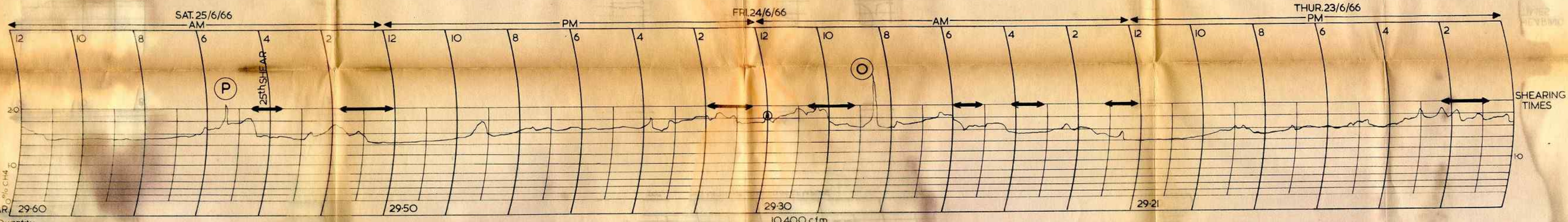
## YARD 3S SOUTH DISTRICT




Air Quantity 10,160 c.f.m.

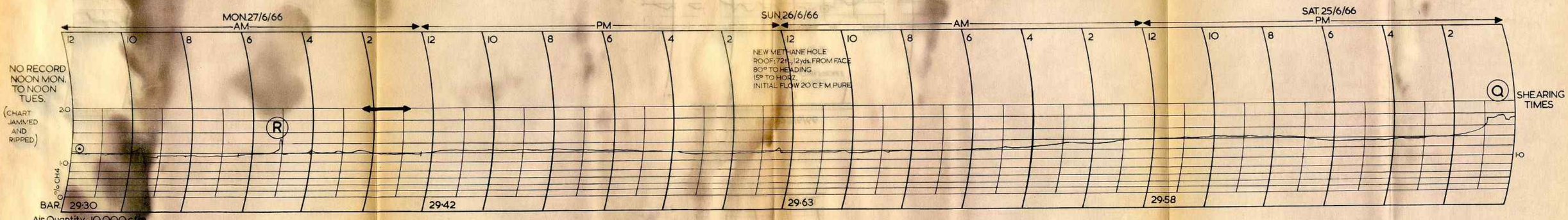



TOTAL DISTRICT METHANE DRAINED 56 C.F.M. PURE




Air Quantity

10,400 c.f.m.




Air Quantity 10,000 c.f.m.

No. 3

# CHATTERLEY WHITFIELD COLLIERY

## YARD 3$^{S}$ SOUTH DISTRICT