Resolving the location and magnitude of the 1918 Queensland (Bundaberg) Earthquake, Australia

Stacey S. Martin, Phil R. Cummins, Jonathan D. Griffin, Dan Clark, Trevor I. Allen

Supplementary Material

Contents

https://doi.org/10.1785/0120240029

Supplementary Material 1 (Tables S1 – S3)

The entire database i.e., Tables S1, S2 and S3 can be found in file titled "**Martin-et-al-1918-QLD-Tables S1, S2, S3.xlsx**" accompanying this BSSA paper. This file (including any future updates) can also be found at https://github.com/7point1/1918-Queensland

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Supplementary Material 2 – Walter Bryan's Correspondence

This section documents correspondence between Walter Bryan and Leo Cotton (Sydney Observatory) and Father William O'Leary (Riverview College Observatory) between 24 May 1935 and 11 June 1918.

https://doi.org/10.1785/0120240029

The University of Sydney

24/8/35

My dear Bryan

I am enclosing the reports of Riverview & Sydney Observatories. I meant to write you before but have been rather rushed and am now about to take an excursion into the field.

You know of course that no estimate of direction can be made except from the first impulse received and this does not appear to have been sufficiently well defined for the purpose in the 1935 earthquake. You can probably form some idea of the epicentral region from the intensities as revealed by country & coastal reports (Country newspapers are useful)

With kindest regards and best wishes Sincerely yours

Leo A. Cotton

(N-S. component), instrumental displacement 27.0 m/m. corres-
ponding to a true earth movement of 160 microns, and 18h.22m.19s.
(E-W. component), instrumental displacement 39.1 m/m. corres-
ponding to a true earth movement of 190 microns, as against
April 12, 1935, largest movement at 01 38 02 (N-S.), instrumental
displacement 26.0 m/m. = 100 microns approx. and 01h. 38m. 16s.
(E-W.) 27.5+ m/m. = 90+ microns approx.

Times are given in Greenwich Mean Time.

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RIVERVIEW COLLEGE OBSERVATORY,
SYDNEY,
N. S. W.

Comparison of Earthquake Records of June 6, 1918 & April 12, 1935.

June 6, 1918.	h	m	s	April 12, 1935.	h	m	s
t Preliminary waves recorded	18	16	53	1st Prelim. waves	01	34	20
condary waves		18	59	Secondary		36	19
ng waves		19	06	Long		37	33
ximum waves		19	35	Maximum		37	51

icentral distance 1140 km. (708 miles) Epicentral distance 1080 km. (671 miles)

In both cases the Prelimimary phases are too small and indefinite to permit an accurate determination of epicentre.

June 6, 1918 probably φ 24° S., λ 154° E. Felt in many places in SE. Queensland. Maximum intensity about IV F.M. Largest movements recorded at Riverview were at 18h. 19m. 35s. (N-S. component), instrumental displacement 27.6 m/m. corresponding to a true earth movement of 160 microns, and 18h.22m.19s. (E-W. component), instrumental displacement 39.1 m/m. corresponding to a true earth movement of 190 microns, as against April 12, 1935, largest movement at 01 38 02 (N-S.), instrumental displacement 26.0 m/m. = 100 microns approx. and 01h. 38m. 16s. (E-W.) 27.5+ m/m. = 90+ microns approx.

Times are given in Greenwich Mean Time.

https://doi.org/10.1785/0120240029

4th June, 1935.

Professor L.A. Cotton,
Department of Geology,
University of Sydney,
SYDNEY.

My dear Cotton,

Many thanks for your kind letter of April 24th and the enclosed reports from the Sydney and Riverview College observatories.

I am writing to the latter place today to point out that although Dr. Pigot placed the epicentre of the 1918 earthquake as 610 miles north-north-east of his observatory, yet the after shocks of that quake, the disturbance of last month and its after shocks and a further severe tremor of Saturday night last all occurred in and about an area some 600 miles north-north-west of Sydney.

I am strongly inclined to the belief that our 1918 shake (the most severe experienced in Queensland) was due to movement not on the sea bed but in the Gayndah region where all the later movements took place. It is probably significant that this area lies on the most important of the "anticlinal axes" shown in Figure 2 of my Earth Movements in Queensland. I am endeavouring to collect what information I can on the 1918 quake but it is difficult after such a lapse of time.

With kindest regards and with grateful thanks for your help.

Yours sincerely,

WRB.

https://doi.org/10.1785/0120240029

4th June, 1935.

Father O'Leary,
Riverview College Observatory,
SYDNEY.
N.S.W.

Dear Sir,

Professor Cotton has kindly forwarded to me your records of our earthquake of April 12th of this year and a comparative statement for that of June 6th 1918. These have proved of the greatest interest to me and I am most grateful to you for preparing them, but they raise a very important point on which I should like to have your opinion. The point concerns the position of the epicentre of the 1918 disturbance. In the first place your records place it as distant 1,080 km., while the late Charles Hedley in his article "The Queensland Earthquake of 1918"* stated that "Dr. Pigot calculated the epicentre of the earthquake as 1,180 kilometres (610 miles) N.N.E. of his observatory". I take it that the figure given by Hedley is incorrect.

In your report you place the centre as "probably ϕ 24°S., λ 154° E". I infer from your underlining the word "probably" that the first impulses received were not sufficiently well defined to enable the position of the epicentre to be placed with confidence. Now, it seems to me that there is a good deal of evidence for the supposition that the epicentre was not on the sea bed but some hundred miles inland. Thus the after shocks of the 1918 quake, the disturbance of April 12th this year, the after shocks of this disturbance, and a further severe tremor which took place on last Saturday, June 1st at about 10.15 p.m. (I wonder whether you recorded it) were all in the Bundaberg hinterland and close to, if not actually on, a most important geological structure along which important faulting and other movements have taken place. Further, from the few reports quoted by Hedley, the 1918 disturbance would seem to have been as marked at Degilbo and at Banana as at Bundaberg suggesting that the epicentre was west of Bundaberg rather than east.

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* Trans. Roy. Geog. Soc. Aus. Qld. Vol. 1, No. 16, p.151.

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In view of those facts I should be very grateful if you could inform me as to the probable error in determining the direction of the 1918 disturbance and the possibility of the epicentre lying some distance inland in the same region as the later tremors.

With very best wishes and again many thanks.

I am,

Yours sincerely,

WNB

Acting-Professor of Geey is

https://doi.org/10.1785/0120240029

RIVERVIEW COLLEGE OBSERVATORY,
SYDNEY,
N.S.W.

1935, June 7th.

Professor W. H. Bryan,
Department of Geology,
University of Queensland,
BRISBANE.

Dear Professor Bryan,

In reply to yours of 4th inst. I regret that we are not able to give you any very definite information about the earthquake of June 6th 1918. Having examined our records we are rather inclined to revise the readings that were made in Father Pigot's time. A wave that he has taken as S seems to be rather late, and an earlier wave that is well marked seems to give a better reading. This would place the earthquake at a distance of 990 km. Nevertheless this is not absolutely definite because we got only an emerging P, and consequently there must be some doubt about the distance. It may be correct or it may be at a greater distance. The distance that we gave in the former letter was the mean between Father Pigot's distance given in the Bulletin, and the distance that we made out by the aid of the latest travel times and using Father Pigot's interpretation of the record.

With regard to the direction the records alone here are not capable of giving the direction as the onset of the P_n waves was not sufficiently definite. Father Pigot has not left any notes with regard to the matter beyond what are contained in the Bulletins.

With best wishes.

Yours sincerely,

Wm. O'Leary S.

Director.

I notice that this is rather stiff and stilted. I dictated it. That explains. I tried to get an epicentre by Perth and Adelaide, but their readings are not sufficiently concordant to get anything definite. If you wish I shall send you our original records for both Bridgetown. Perhaps isoseismal from local reports may help to narrow down the epicentre. Will

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11th June, 1935.

Rev. Father W. O'Leary, S.J.,
Riverview College Observatory,
SYDNEY.
N.S.W.

Dear Father O'Leary,

Many thanks for your letter of June 7th and the additional information.

As you may have guessed I know very little about earthquakes from the instrumental side, my real interest being of course geological, nevertheless I should greatly appreciate the opportunity of studying those numbers of your Bulletin that deal with our earthquakes of June 6th 1918, and April 12th, 1935, respectively. Unfortunately, no copies of your publications are available in Queensland. Would it be possible for me to borrow the required numbers from your library or to have the references copied? I hate to worry you again like this but I am trying to place our seismological work here on a sound basis.

Since last I wrote I have endeavoured to gather together all the available accounts of the 1918 disturbance. These were assessed in terms of the R.F. scale and plotted on a map of Queensland in the hope that by this means the epicentre would be placed. Unfortunately, the results were very irregular and far from conclusive. The only point about which I feel confident is that the apparent intensity was greater at Rockhampton than any where else. (Hedley's paper suggests that Bundaberg was most strongly affected but I cannot agree). This would seem to shift the epicentre northwards from Father Pigot's position, but your re-examination of the instrumental records suggests that it should be moved further south. The whole business is most confusing. Of course it is quite possible that the minor disturbances which followed in the area between the Burnett and Dawson waters may have been sympathetic movements but not after-shocks.

With regard to the disturbance of April 12th 1935, my colleague Dr. Whitehouse and I have received, assessed and plotted reports from one hundred and three stations and have arrived at conclusions which, though tentative, will not, I think, be materially modified when we succeed in filling the gaps.

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The most important of these conclusions is that the most disturbed area (R.F. 7 or thereabouts) is contained in a relatively narrow strip joining Gayndah and Monto. If this line be extended for 30 miles beyond Monto (i.e. to the N.N.W.) into a sparsely settled area from which we have not yet received reports it will intersect the arc of radius 1080 kilometres (your calculated distance) from Sydney. Our map shows a remarkable parallelism between apparent intensity and geological structure.

With many thanks for your very kind help.

Yours sincerely,

WHB.

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be materially mod...

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Supplementary Material 3 – Jack Rynn's unpublished abstract

This section presents Jack Rynn's unpublished abstract to an unpublished article on the 1918 earthquake. Scribbled notes are by Jack Rynn himself.

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A REAPPRAISAL OF QUEENSLAND'S LARGEST-KNOWN EARTHQUAKE - THE "QUEENSLAND" EARTHQUAKE OF 7 JUNE 1918 (MAGNITUDE ABOUT 6)

by J.M.W. RYNN

ABSTRACT: The largest earthquake known in Queensland occurred at about 4.15 am on Friday 7 June 1918 (1815 hrs 6 June 1918 UT) in the central coastal region of the state. This earthquake, known as the "Queensland" earthquake, had a surface wave magnitude M_S about 6.2. Its effects were felt over an area of approximately 300,000 sq.km estending from Mackay to Lismore and west to Roma. The strongest intensity reported, MM = VI, came from the Rockhampton and Bundaberg areas.

This reappraisal attempts to clarify inconsistencies present in the published data and, together with additional unpublished data, define the seismic parameters in the most plausible manner. The analysis indicates that the epicentre was most probably off-shore in the vicinity of the Capricorn-Bunker Groups of islands east of the Rockhampton-Gladstone coast using instrumental data rather than that suggested by supposed aftershock data about 150 km inland in the Monto-Cracow area. Reported aftershocks in this latter region may possibly be earthquakes unrelated to the large event having occurred during the same time period purely by coincidence.

The effects of this earthquake are of interest when considering the affected region as it exists today. If an earthquake with similar characteristics were to occur again, the seismic hazard in relation to consequent effects on people and property would be most serious particularly because of the extensive industrialisation of the region.

(In Press: Jour. Geol. Soc. Aust.)

Supplementary Material 4 – Jack Rynn's correspondence

This section presents Jack Rynn's correspondence relating to the 1918 earthquake with Ian Everingham and David Denham.

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BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS
CNR CONSTITUTION AVENUE AND ANZAC PARADE, CANBERRA
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Please address all communications to the Director
Telephone: 499111
Telegrams: BUROMIN
Telex: 62109

Department of National Development
and Energy

In reply please quote: 77/957

11 July 1980

Dr J. Rynn,
Department of Geology & Mineralogy,
University of Queensland,
ST LUCIA QLD 4067.

Dear John,

The BMR is preparing an atlas of isoseismal maps and wishes to include all available data in this atlas.

I remember that the Queensland University collected intensity data for an earthquake felt in Perth and Darwin during the early 1960s (possibly 4 November 1963) and I would like to include this work in the atlas. If you find it difficult to finish the map the BMR would be happy to do it for you with, of course, full acknowledgement to you.

As the earthquake's effects at Darwin are of particular interest for risk estimates we feel that it is important to publish the intensity data.

Yours sincerely,

[redacted]

(I.B. EVERINGHAM)
Acting Supervisor

McGregor at Geneva again for the interminable detect the bomb discussions

How's life? Just finished 1979 central West seismicity – results about zero despite ISC. But about 7 W.A. events on CGS lists. Have you got any spots (report positions) for the Kempsey map – your draft paper is on my desk right now! I've been at J.W. for years for the other info I know you've been & will find it!! Beers & cheers [redacted]

https://doi.org/10.1785/0120240029

JR/ms

18th July, 1980.

The Director,
Bureau of Mineral Resources,
Geology & Geophysics,
P.O. Box 378,
CANBERRA CITY. A.C.T. 2601.

Attention: Mr I.B. Everingham,
Acting Supervisor,
Seismology and Geomagnetion Section.

Dear Ian,

I acknowledge receipt of your letter of 11 July re isoseismal map atlas. Regarding the Banda Sea earthquake of 4/11/63, you are correct in that John Webb and Steve Hearn are working up this data. John will contact you directly about this.

As you may remember Col Lynam and myself are working up all Qld. isoseismal data to be included in our paper 'The Seismicity of Queensland' currently in progress. I told Ron a while ago that all these maps would be passed onto BMR for the atlas. There are about 18 earthquakes for which isoseismal maps will be available. These include the 1918 'Queensland', 1935 'Gayndah', 1947, "Maryborough' and 1960 'Mt Glorious' earthquakes already on your isoseismal maps file. Also included in this list are the 1978 'Esk' and 1979 "Kempsey' events which are in papers under review for publication. The list is attached for your information with copies of a couple of the maps..

I have also enclosed an isoseismal map for the 'pseudo-earthquake - a large quarry blast - on 4/12/78 near Brisbane (actually related to the Wivenhoe Dam construction). This shook up Brisbane and vicinity and we feel it is of significant interest for the atlas - what do you think? Also included is a relook at the 1918 event which I hope to publish as a note soon.

One important point (to us) is drafting isoseismal maps. As you can obviously see my method is different to the BMR's. Personally I like yours and feel that all Australian isoseismal maps should be of this BMR format. At this stage Col and I have 'hand drafted' maps and we are ready to finally draw them up. At present we have a problem in that neither of us will have the time over the next few months to do this. Thus, I wish to make the suggestion to you that we send our preliminary maps to you and your BMR draftsmen draw them up. If some agreement could be reached can this then I would ask that we be allowed to publish them in our papers (remember as I said that all the isoseismal maps are part of the Qld. seismicity paper) with due recognition to your drafting staff. Please give this idea some

..2/

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thought and let me know your feelings.

Regarding the Kempsey paper - I have done little more on it other than comments by John, however, your letter has spurred me on again. I do not understand your request of 'Spots' (report positions) for the Kempsey map - please explain. Regarding the draft you have, does it contain Figure 1? If so could you please send me a copy as I have lost the original; also a copy of Table 1! Re-reading your comments in your letter of 4/1/80 (Ref. 80-32), I intend to redraft the isoseismal map in accordance with your format (that is, by addition of locations and intensity estimates for each questionnaire as open circle on the map, addition of named places as solid squares and places where event not felt as solid circles) and expand the section on 'Isoseismal Effects' with a more detailed account of the reports. I shall send you a copy of the revised draft for comment when completed.

Life up here is the same as usual - fast and furious! Hopefully will see you in Canberra within a month or less.

Regards to all in the Section.

Sincerely,

(Dr J.M.W. Rynn)
Research Fellow in Seismology.

(ENC.)

https://doi.org/10.1785/0120240029

AUSTRALIA

Department of National Development
and Energy

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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Telegrams: BUROMIN
Telex: 62109

In reply please quote: 80/32

24 September 1980

Dr J.M.W. Rynn,
Department of Geology & Mineralogy,
University of Queensland,
ST LUCIA Qld 4067.

Dear Jack,

Had hoped to see you in Canberra but gather you'll not visit.

... Enclosed are several copies of the isoseismal map drawn by BMR from your draft and a quickly edited copy of your paper on the Kempsey earthquake, 6 September 1979. Please acknowledge the BMR's drawing effort if the map is published. *

The Isoseismal Atlas drawings are complete for known maps and it is arranged with maps in chronological order so that new maps of past or future 'quakes can just be added to the Atlas as they become available.

Regards,

[redacted]

(I.B. EVERINGHAM)

* the Atlas map is slightly different but we'll forget about that — in case anyone complains

[redacted]

https://doi.org/10.1785/0120240029

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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Department of National Development
and Energy

In reply please quote: 77/957
80/32

31 July 1980

Dr J.M.W. Rynn,
Department of Geology and
Mineralogy,
University of Queensland,
ST LUCIA Qld 4067.

Dear Jack,

Thank you for your letter. I look forward to seeing your 'Seismicity of Queensland' paper and your isoseismal maps. It's about time the former was written so all the information about Queensland seismicity is available in one place.

Regarding isoseismal maps - I could arrange for them to be drawn for our Atlas. All I require is (a) a draft map, any scale, (b) the observation points and the intensity there (c) any instrumentally determined mangitude values with their source e.g. CGS, Q.UNI etc. (d) the best epicentre.

At present drawings for over 60 isoseismal maps are being finalised in our drawing office so that the sooner you send your drafts the better. Each map has the reference to the publisher and is accompanied by notes about the earthquake and its affect if available, so that if a map is a published map it simplifies our work in assembling the Atlas.

Could you go to some trouble to ensure your magnitudes are 'real'. I have tediously followed up some famous Australian earthquake magnitudes and eventually found that they were found from the macroseismic evidence; so that they're not much use for intensity attenuation research, and the magnitude is shown on the drawings as 6.0I, say. It would be interesting to include your 'pseudo quake' if you could calculate the 'magnitude' of the explosion from the seismogram and the charge size.

Life up there may be fast and furious - I'd like to live a fast life here but it is too cold for such activities, so I guess I'll just remain furious.

Regards,

[redacted]

(I.B. EVERINGHAM)
Geophysicist

https://doi.org/10.1785/0120240029

THE UNIVERSITY OF QUEENSLAND

DEPARTMENT OF GEOLOGY AND MINERALOGY
ST. LUCIA, QUEENSLAND, AUSTRALIA, 4067

JMWR/ra

12th February, 1981.

The Director,
Bureau of Mineral Resources,
Geology and Geophysics,
P.O. Box 378,
Canberra City A.C.T. 2601

Attention: Mr. Ian Everingham, Seismology and Geomagnetism

Dear Ian,

Enclosed are the first set of isoseismal maps for drafting and hence inclusion in the BMR Isoseismal Atlas. As with the Kempsey earthquake map, you sent me several "glossy" prints, as I requested for inclusion as the figure in our paper (with due acknowledgment of course!). Could you do the same with these additional events (glossy of Kempsey enclosed for example - also please return it).

The following is the list of events enclosed with the base maps used in parenthesis:

"QUEENSLAND" EARTHQUAKE 6 JUNE 1918 (1:250,000 QLD STATE MAP)
CAPRICORN - BUNKER EARTHQUAKE 28 NOV 1978 (1:1,000,000 BRISBANE AND ROCKHAMPTON)
MACKAY EARTHQUAKE 5 APRIL 1950 (1:250,000 MACKAY AND PROSERPINE)
ATHERTON EARTHQUAKE 19JUNE 1950 (1:250,000 MOSSMAN, CAIRNS, ATHERTON AND INNISFAIL)
MOURILYAN EARTHQUAKE 4 MAY 1954 (1:250,000 CAIRNS, INGHAM AND INNISFAIL)
CAIRNS EARTHQUAKE 1 DECEMBER 1958 (1:1,000,000 TOWNSVILLE AND COOKTOWN)

The 1:250,000 Qld map is included in the event of you not having one.

Details of each event are also enclosed. The only comment is for the 1918 epicentre. It appears that it was off-shore (I have written a paper "A Reappraisal of Queensland's Largest Known Earthquake - the "Queensland" Earthquake of 7 June 1918 (Magnitude about 6"); the date on this title is EST not UT as is indicated on the attached "Details" sheet. I would suggest both G & R / Fr. O'Leary's (24° S, 154° E) and ISS (23.3° S, 150.6° E) epicentre go on the atlas map and the accompanying write-up page for this event will explain such. On this "write-up page" I am preparing one for each eathquake based on the one in the atlas for the Picton earthquake - is this satisfactory?

By the way, I notice that in the "Details" at the bottom of each map in the Atlas you use "HYPOCENTRE" - should not this be "EPICENTRE" (!) as "DEPTH" is given as a separate parameter?

I also think you should put the REFERENCE with the lower details on the isoseismal maps as well as in the covering note for each event.

Don't forget your promise to copy the orange Reinsurance book.

All the best.

Yours sincerely,

[redacted]

Dr. J.M.W. Rynn,
Research Fellow in Seismology.

enc.

TELEPHONE 3772375 TELEX: UNIVQLD AA40315 TELEGRAMS: BRISBANE UNIVERSITY

https://doi.org/10.1785/0120240029

PS Please return our original pencil drawings; thanks Jo

THE UNIVERSITY OF QUEENSLAND

DEPARTMENT OF GEOLOGY AND MINERALOGY
ST. LUCIA, QUEENSLAND, AUSTRALIA, 4067

Addendum:

I have also included the following isoseismal maps:

1) ESK EARTHQUAKE 26 APRIL, 1978 (BASE MAP: SHELL ROAD MAP "BRISBANE ENVIRONS")

2) SPLITYARD CK. DAM CONSTRUCTION BLAST 4 DECEMBER, 1978 ((a) 1:100,000 ESK, HELIDON, CABOOLTURE, IPSWICH; (b) BRISBANE CITY - PLOTED ON ORIGINAL BASE MAP)

Note that the latter (4.12.78) was a blast associated with the Wivenhoe Dam construction project. The Esk and Splityard papers as submitted to Pap. Dept. Geol. Univ. Qld. are being sent under separate cover to you.

And an additional nudge - please send me back all these originals but ASAP the "QUEENSLAND" (6 June, 1918) and "CAPRICORN-BUNKER" (28.11.78) as I need these to complete the two papers I'm writing on them at present.

Still to come are the maps for some southern Queensland earthquakes in the Wide Bay-Burnett area - we are working on these now. When we send these we will also send you a list of all macroseismic data we have on file which not only includes those for unlaid isoseismal maps could be drawn but also these for which only a few felt reports (yet reliable!) were obtained.

You can tell David that the bananas are really bending at the moment (although the senior partner is doing it with the Kiwis just now!)

Cheers Ian!

[redacted]

JMWR 13th February, 1981.

TELEPHONE 3772375 TELEX: UNIVQLD AA40315 TELEGRAMS: BRISBANE UNIVERSITY

https://doi.org/10.1785/0120240029

(1) "QUEENSLAND" EARTHQUAKE:

DATE:	6 June, 1918
TIME:	18:15 UT
MAGNITUDE:	M_S (RIV) = ; m_b
EPICENTRE:	(a) 24° S, 154° E (Gutenberg and Richter/RIV); (b) 23.3°S, 150.6° E.
DEPTH:	(crustal)
REFERENCE:	Rynn, J.M.W. (1981): Pap. Dept. Geol. Univ. Qld, in press.

(2) CAPRICORN - BUNKER EARTHQUAKE:

DATE:	28 November, 1978.
TIME:	17:33:36 UT
MAGNITUDE:	5.0
EPICENTRE:	23.36° S, 151.43° E.
DEPTH:	12 km
REFERENCE:	Rynn and Webb (1981)

(3) MACKAY EARTHQUAKE:

DATE:	5 April, 1950
TIME:	19:50:52 UT
MAGNITUDE:	5.0
EPICENTRE:	21.1° S, 149.2° E.
DEPTH:	(crustal)
REFERENCE:	Webb et al (1981

(4) ATHERTON EARTHQUAKE

DATE:	19 June, 1950
TIME:	[illegible] UT
MAGNITUDE:	4.5
EPICENTRE:	17.5° S, 145.5° E.
DEPTH:	(crustal)
REFERENCE:	Webb et al (1981)

https://doi.org/10.1785/0120240029

(5) MOURILYAN EARTHQUAKE

DATE:	4 May, 1954
TIME:	17:05 UT
MAGNITUDE:	4.0
EPICENTRE:	17.7° S, 146.0° E
DEPTH:	(crustal)
REFERENCE:	Webb et al (1981)

(6) CAIRNS EARTHQUAKE

DATE:	1 December, 1958
TIME:	10:38:33 UT
MAGNITUDE:	5.3
EPICENTRE:	16.5° S, 145.5° E.
DEPTH:	(crustal)
REFERENCE:	Webb et al (1981)

(7) ESK EARTHQUAKE

DATE:	26 April, 1978
TIME:	11:53:13.6 UT
MAGNITUDE:	3.0
EPICENTRE:	27.23° S, 152.31° E
DEPTH:	26km
REFERENCE:	Rynn and Webb (1981)

(8) SPLITYARD CK, DAM BLAST

DATE:	4 December, 1978
TIME:	06:42:50 UT
MAGNITUDE:	3.5 (2.72 tonne Explosive)
EPICENTRE:	27.38° S, 152.64° E
DEPTH:	0 km
REFERENCE:	Rynn and Webb (1981)

https://doi.org/10.1785/0120240029

REFERENCES

Rynn, J.M.W. (1981): A Reappraisal of - Queensland's Largest Known Earthquake - The "Queensland" Earthquake of 7 June, 1918 (Magnitude about 6)
Submitted to: Pap. Dept. Geol. Uni. Qld.
(For (1))

Rynn, J.M.W. & Webb, J.P. (1981) The Capricorn - Bunker, Queensland, Australia, Earthquake and other Seismicity Associated with a Passive Continental Margin.
Submitted to: Bull. Seism. Soc. Amer. (letter).
(For (2))

Rynn, J.M.W. & Webb, J.P. (1981) The Esk, Southeast Queensland, Earthquake of 26 April, 1978.
Submitted to: Pap. Dept. Geol. Univ. Qld.
(For (7))

Rynn, J.M.W. & Webb, J.P. (1981) Pseudo - Isoseismal Effects on the City of Brisbane of a Quarry Blast on on 4 December, 1978.
Submitted to: Pap. Dept. Geol. Univ. Qld.
(For (8))

Webb, J.P. Rynn, J.M.W., Lynam, C.J. & Millican, J.M. (1981) The Seismicity of Queensland 1880 - 1980.
Submitted to. Geol. Soc. Aust. Bull.
(For (3), (4), (5), (6)).

https://doi.org/10.1785/0120240029

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS
CNR CONSTITUTION AVENUE AND ANZAC PARADE, CANBERRA
Postal address: P O Box 378, Canberra City, A.C.T. 2601
Please address all communications to the Director
Telephone: 499111
Telegrams: BUROMIN
Telex: 62109
Department of National Development and Energy

In reply please quote: 81/538

13 April 1981.

Dr J. Rynn
Department of Geology
Seismology Section
University of Queensland
QLD 4067

Dear Jack,

BUNDABERG QUAKE - 1918

In your original isoseismal map you have three epicentres shown but they don't seem to be correct. A copy of my version of epicentre locations ... is attached - would you please comment so that your interpretation of data can be included in the drawing.

For our final BMR edition (with reference to you of course) we only require one epicentre the position which should be based on instrumental data, which, in this case, is nearly zero.

I'm having two drawings done - one your original and the other the BMR version. In most cases, the drawings will be identical but for the important 1918 Bundaberg quake our version is slightly different to yours.

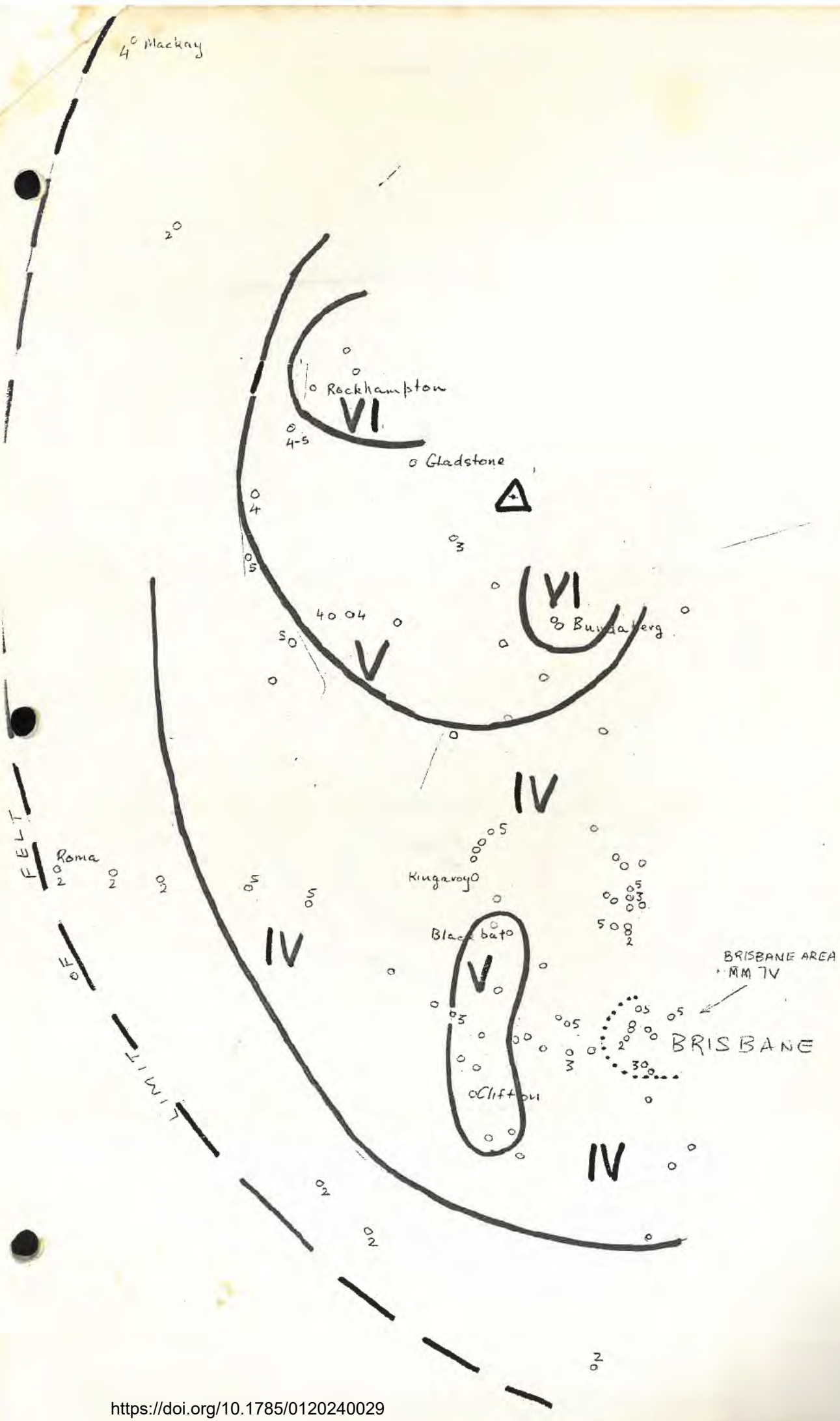
When do you reckon J.W. will release the 1963 Band-Sea isoseismal map?

Regards, cheers & beers!

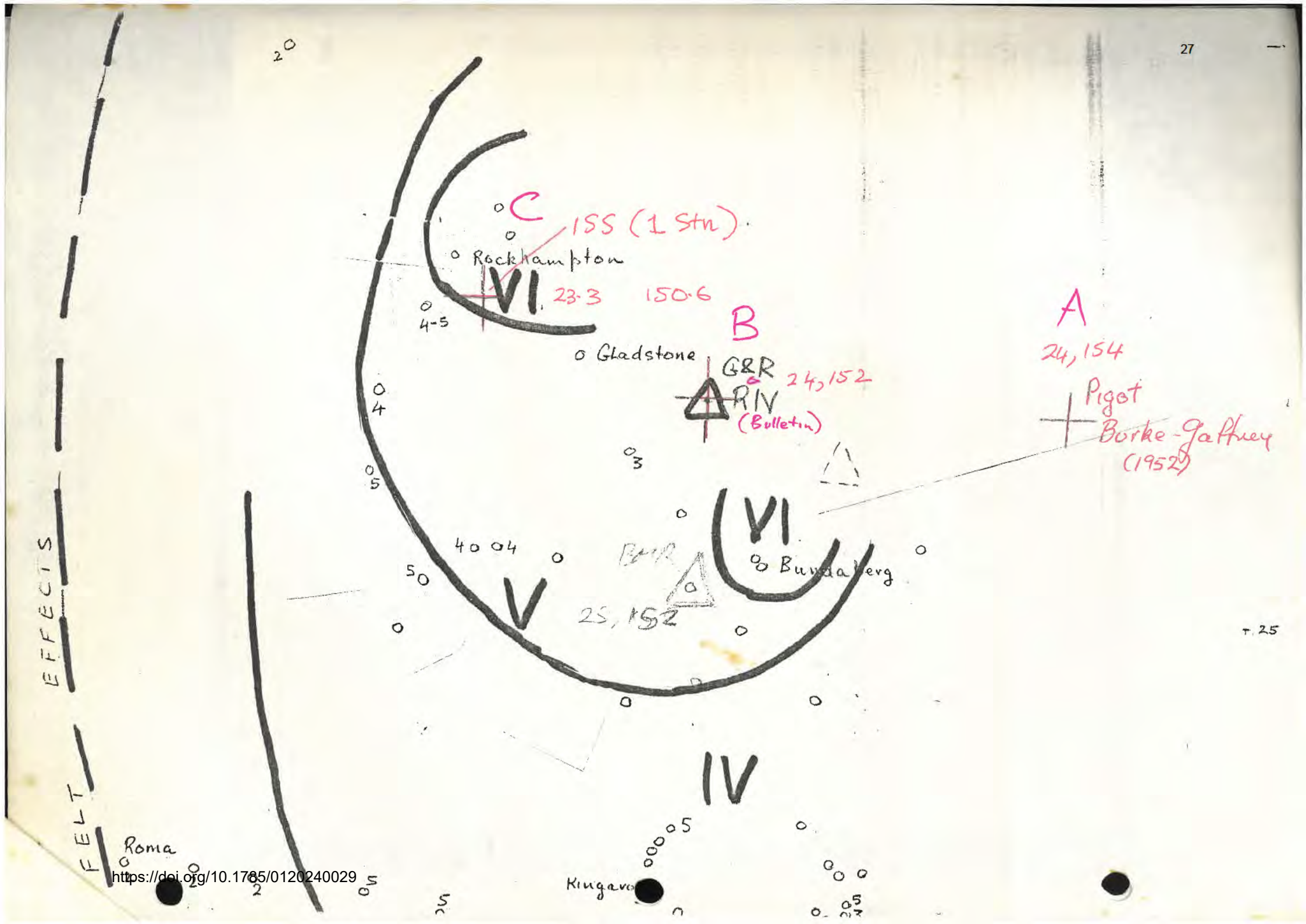
[redacted]

I.B. Everingham

https://doi.org/10.1785/0120240029



https://doi.org/10.1785/0120240029



https://doi.org/10.1785/0120240029

JMWR/RA

28th April, 1981.

The Director ,
Bureau of Mineral Resources,
Geology and Geophysics,
P.O. Box 378,
Canberra City A.C.T. 2601

Attention: Mr Ian Everingham

Dear Ian,

Received your letter re comments on 1918 earthquake and take of original (with copies - many thanks!) isoseismal maps. Re your letter there are several points.

(1) the name of the earthquake - definitely NOT Bundaberg. We wish to retain the "original" name (even in the literature) of the "QUEENSLAND" earthquake. This is how it is refered to in our "Seismicity"of Queensland" paper in preparation and my reappraisal paper of that particular went also in preparation. Both John and myself respectfully request that this name "QUEENSLAND EARTHQUAKE" be retained.

(2) Re the epicentre:

(a) I did make a mistake with the G & R/RH position - it is indeed 24°S, 152°E (not 24°S, 154°E as I had it).

(b) Where did the "BMR" epicentre (25°S, 152°E) come from? (Please let me know ASAP on as possible).

(c) I do NOT think we should have one epicentre in our listings and a different one for the BMR listings and isoseismal maps. As you infer (Paragraph 2 of your letter) the final accepted epicentre should be the one from my paper. I am still working on the data (and now the addition epicentre from (b)) so in a few weeks I'll give you what John and I regard as the "last estimate".

(d) Note that the ISS position is indeed the town of Rockhampton! this is most unsitable as both Laurie Drake (1976 paper) and myself feel that it was probably a "guess" based on the nearest large town. Hence I would discount this.

(3) Re isoseismal map - why two versions? Again I don't think we should have one for us and another for BMR - the map should be the one in my paper. Please comment further on this point.

Regarding IPW and the 1963 Banda Sea isoseismal map - I suggest a another earthquake under IPW be get him going!! I've pushed him again and I can only hope it produces some results(?!).

https://doi.org/10.1785/0120240029

If you get the chance I would like to have a short chat on the phone so if you can spare me a few minutes call me upon receipt of this letter. Try any number (377 2552) but if unavailable try 377 2375 and ask the girl to find me.

There is a lot more to tell but time is pressing so I'll fill you in in later conversation.

Cheers (and beers - xxxx of course!)

Dr. J.M.W. Rynn,
Research Fellow in Seismology.

P.S. Almost forgot about the epicentral listings and maps - our sincere thanks. Hopefully we can "swell" the list with QLDUNI entries in the very near future.

https://doi.org/10.1785/0120240029

JWMR:VM

4th August, 1981

The Director,
Bureau of Mineral Resources,
Geology and Geophysics,
P.O. Box 378,
Canberra City ACT 2601.

Attention: Mr. Ian Everingham
Seismology and Geomagnetism

Dear Ian,

I am writing to clarify a few points on the 1918 "Queensland" earthquake isoseismal maps. This is in reference to my letter of 28 April written after receiving your letter of 13 April with enclosures of draft isoseismal maps. My apologies for the delayed "pushing" of you - I have been on field work in North Queensland since May having returned to Brisbane early last week.

I refer you to the aforementioned two letters and see comments re my points. In particular I would like to press my point (3) - I still do not know why you "changed" my interprotation re the internities IV and V. I have enclosed a copy of yours map with my original interpretation. Pending your reply, I can only make the comment that most isoseismal maps for central-eastern Qld. earthquakes do indeed have this strange isoseismal of a lobe for V extending southward - I feel the data is sufficent to warrent this (taking into a account the fort that his data was collected in 1918 and I fell was a true record of the effects). I can only refer you to the 1935 "Gayndah" earthquake paper of Bryan and Whitehouse where they have this "Strange lobe". Maybe, as has been suggested by them and also Jones (1959) the isoseimals are affected by the geological conditions.

Thus I suggest that my maps is the one that should be accepted.

Futher to this 1918 earthquake, in particular regarding the epicentre, I am now completing my paper on this and will forward to you my suggested "best estimate" for the epicentre within the next few weeks. Thus I ask that you wait for this so that my final epicentre be the one published on the maps in the atlas.

I eagerly await your comments. All the best to the boys - still waiting to see some of you up here before the end of the year.

Regards

J.M.W. Rynn
Research Fellow in Seismology

https://doi.org/10.1785/0120240029

AUSTRALIA

Department of National Development
and Energy

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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Telegrams: BUROMIN
Telex: 62109

In reply please quote: 81/538

21 September 1981

Dr Jack Rynn
Department of Geology & Mineralogy
University of Queensland
ST LUCIA Qld 4067

Dear Jack,

I'll start this note in the same manner that you did in your letter I'm answering - sorry to be so long winded in answering but I've been on leave, away at Paradise Point, and hence the delay. We'd intended driving up to Brisbane to see you but didn't have the energy to do so.

Firstly - the 'Queensland' earthquake.

We have encouraged use of simple place names near the epicentres of earthquakes in our lists and earthquake titles so that the reader is immediately aware of the earthquake's locality. For example had the Meeberrie 1941 'quake been named the 'Great Western Australian Earthquake' the Meckering 1968 earthquake would have to be named the 'Greatest Western Australian Earthquake' - this sounds exaggerated but it illustrates the point of our thinking. (In any case after reading your paper on Barrier Reef seismicity I'm sure you will soon have a 'Great Queensland' 'quake!!).

A copy of your map of the isoseismals ~~map~~ with our versions of the isoseismals is enclosed. I consider that the area of contentious intensity must be drawn in the MMIV-MMV level, i.e. outside an MMV isoseismal, because overall it is surrounded by areas where intensity was less than MMV. This point is illustrated on the attached map. Experience in PNG and W.A. make it clear to me that relatively high intensities occur over swampy areas, areas of un consolidated sedimentary rock, and in mountainous regions and I feel sure the <u>isolated</u> regions of high intensity inland from Brisbane and at Yeppoon result from these types of geological features. You have final say of course and we would refer to you and use your map (with BMR appendages) in the Atlas. The same applies to the earthquake name - I wish you'd call it the Bundaberg 'quake - the title would be the 'Bundaberg earthquake, Queensland' etc. Would you agree to the 'Bundaberg or Queensland' earthquake, etc?

Would you send copies of your papers referred to in your Great Barrier Reef seismicity paper plus the one by Webb et al. (1981) which was referred to in the text (p 58) but not listed in p 63. We require your descriptions of the felt effects to go with the maps.

.../2

https://doi.org/10.1785/0120240029

Another step in the saga - all the best Jack and give my regards to J.W.

Regards,

[redacted]

(I.B. EVERINGHAM)

P.S.

I made a request for Long Period records of the Balliang & Boorong quakes (see attached example) but only received CTA S.P. records. Could you send the CTA LP WWSS 3000K & CTAO LP's?

I'm looking at MS using at regional (3-20°) distances.

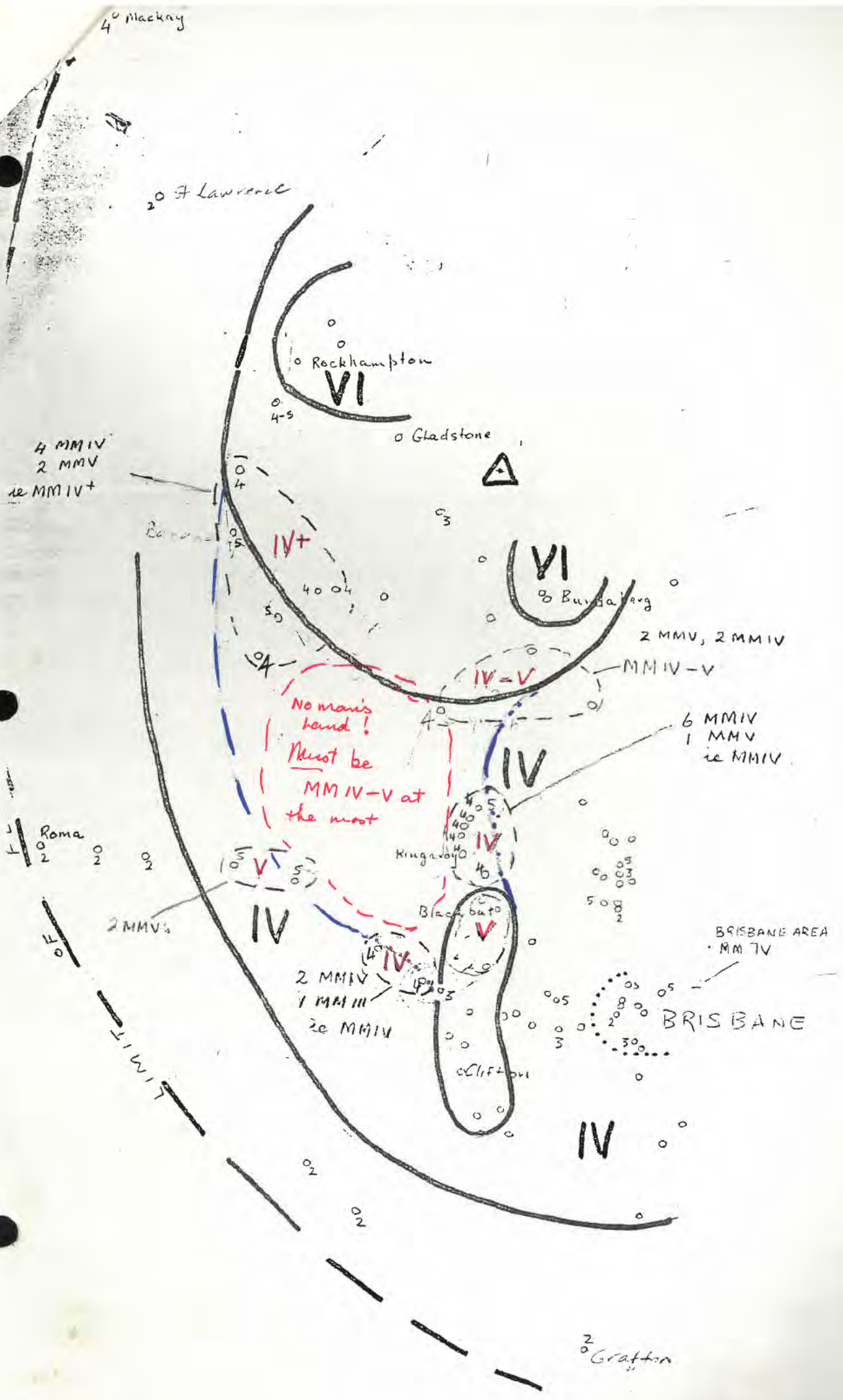
Determined an MS 5.9 for the Bunda.....!!

1918 Queensland quake

[redacted]

https://doi.org/10.1785/0120240029

23



https://doi.org/10.1785/0120240029

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

AUSTRALIA

Department of National Development and Energy

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Telegrams: BUROMIN
Telex: 62109

In reply please quote: 81/538

22 September 1981

Dr J. Rynn
Department of Geology & Mineralogy
University of Queensland
ST LUCIA Qld 4067

Dear Jack,

Drafts of the Queensland isoseismal maps were put on my desk only minutes after my letter (2 September) was picked up for posting.

Would you please edit the enclosed draft maps and return with your comments. I haven't looked at them yet (note Rynn is given as Ryan) but will do so and collate our criticisms.

Would you also give formal permission for BMR publication of the maps and your remarks (verbatum preferably) in the form which you can indicate in your forthcoming reply.

All the best

[redacted]

(I.B. EVERINGHAM)

1918 6 JUNE "QUEENSLAND"
1950 5 APR MACKAY
1950 19 JUN ATHERTON
1954 4 MAY MOURILYAN
1958 1 DEC CAIRNS
1978 16 APR ESK
1978 16 NOV CAPRICORNIA
1978 4 DEC SOUTHERN QLD COAST – Regional
– Brisbane Area

https://doi.org/10.1785/0120240029

JMWR:YH

30th October 1981

The Director,
Bureau of Mineral Resources, Geology and Geophysics
P.O. Box 378
CANBERRA CITY A.C.T. 2601

Attention: Mr. Ian B. Everingham,
Seismology and Geomagnetism

Dear Ian,

Many thanks for your letters of 21 and 22 September 1981 (Reference: 81/538) and the enclosed copies of Queensland isoseismal maps (and from John Webb and Col Lynam). We are all extremely pleased with and thankful for your efforts and those of the BMR drafting staff in getting these done (at last!). Now to comment on the various maps and points you raised therein.

1) The "Queensland" earthquake (6 Jun 1918):

(a) While I fully realise, and indeed entirely agree, with your "policy" of naming earthquakes with "simple place names", in this particular case we here all feel that the name should be "QUEENSLAND EARTHQUAKE". While your comments re the word "great" etc. for the WA events are well taken we did not intend that such a superlative be given to this 1918 event - indeed one reason is primarily historical. In the little that has been written about the event, it was called the "Queensland" earthquake (Hedley, 1925; Prof. Bryan personal communications in the 1920's) and we here know it as such. I have called it the same name in my specific paper (in preparation) on the event. Secondly, I do not think that the event calls for a particular place name - Bundaberg, Gladstone or whatever - since we do not know the"exact" epicentre and, in addition, the "political" point of specifying one particular town could be troublesome (in view of what is happening industrially on this part of the Queensland coast - in other words we do not want any sensationalism or panic by putting on such a particular place name). So, in short, since this event has been known historically as the "QUEENSLAND" earthquake (because of its size) and as my paper refers to it as such we request that you accept the change. This has been duly noted on the edited copy enclosed.

(b) The epicentre:
I would prefer that you use the one I have come up with in my reappraisal of the event. I'm still sorting this out and will get it to you as soon as I can.

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(c) The "no-man's land" MM IV-V northwest of Kingaroy:
I note your comments and indeed see your point of view - however I do not fully agree with you based on the data from this and other Qld. earthquakes regarding intensity values in this area. Indeed this is a sparsely populated area, even more so in 1918 (!), but we all feel that the isoseismals should be as Rynn (1981) interpreted them. You have reinterpreted my map, not data. So I respectfully request that you change this map back to my original. I have enclosed my original draft (please return) for this purpose.

In addition I feel you have been too "frugal" in putting place names on the map. As you have already given us permission to reproduce such isoseismal maps in our papers (with due acknowledgement to BMR) I would like to see this map comply with my ideas. The other point is that some of the omitted place names are important to the text of the paper. I have underlined those I require in red on my original map enclosed.

If you have some great objectinon to doing this then could you send my your base draft map (final drawing for printing) and I'll add the towns I need myself.

(d) Re your handwritten comment on letter of 21.9.81 that you determined an MS = 5.9 for this event - please give me details of how you did that. If you have no objections, I wish not only to have such details but also to include them in my paper as another independent magnitude determination (with due "personal communication IBE, 1981" acknowledgment). Do you agree with the above?

2) "Mackay" earthquake, 5 APR 1950
No comment on map - what does "(1)" mean for the magnitude?

3) "Atherton" earthquake: 19 JUN 1950
No comments on map - again what does "(1)" mean on magnitude?

4) "Mourilyan" earthquake: 4 MAY 1954
same as for (2) and (3) - the "(1)" again!

5) "Cairns" earthquake: 1 DEC 1958
same as for (2), (3) and (4).

6) "Esk" earthquake: 26 APR 1978

(a) This map also suffers from the same problems as the 1918 earthquake - it is for a particular earthquake in reference to a paper. Thus we would like to see a larger map to include the Wivenhoe Dam, Somerset Dam and several towns. It must be realised that the importance of this earthquake lies in the Wivenhoe Dam project (now and for the future). Thus I have enclosed my original with red markings on what must be included.

https://doi.org/10.1785/0120240029

(b) Spelling "Rynn"

(c) magnitude determiantion - not "BRIS": or you may remember the ML was determined by BMR from our data. So should this be BMR or BRS - your decision?

7) "Capricornia" earthquake: 28 Nov. 1978

(a) The name of this event is not Heron Is. but CAPRICORNIA - this is the name in our paper and refers to the region of the epicentre VIZ. the Capricornian section of the Great Barrier Reef Marine Park. For the nature of the paper this name is essential so please change it.

(b) Again the place names come into account because of the references to them in the paper. It is also important to have your version extended to include Mackay and Sarina to the north of St. Lawrence - we wish to compare the 1918 and these events. So I would request that this be redrawn to enable my original (copy enclosed - please return when finished).

(c) Reference is Rynn, Webb and Flood (1982)

(d) Magnitude reference - not "BRIS"; either BMR or BRS as same comments as for Esk 1978 earthquake apply - your decision.

8) Splityard Ck. Blast: 4 DEC 1978

For both maps:

(a) Spelling "Rynn"

(b) Magnitude reference - in this case not "BRIS" but should be "BRS"

(c) Afterthought - maybe on "Brisbane Area" map you could include "University of Queensland" as a place name.

For those isoseismal maps already in the Draft BMR Isoseismal Atlas the following comments apply:

(a) 6 JUNE 1918 "Queensland" earthquake:

To be deleted - replaced by revised version now in hand.

(b) 12 APRIL 1935 "Gayndah" earthquake

(i) Date to be put on heading

(ii) Reference (Bryan and Whitehouse, 1935) to be added

(iii) Note to be made to the effect that in original paper Bryan and Whitehouse used R-F scale; map has been modified by (?) to show MM values (maybe this could go in the description?)

../4

https://doi.org/10.1785/0120240029

(iv) Note also the epicentre of Jones (1959) - it is different to that in the original Bryan and Whitehouse paper (maybe this comment should go in the description rather than two epicentres on the map?)

(c) 11 JUNE 1947 "Maryborough" earthquake:

(i) Date to be put on heading

(ii) Reference (Jones, 1948) to be added.

(d) 17 NOVEMBER 1960 "Mt. Glorious" earthquake (2 maps):

(i) Date to be put on heading

(ii) reference (Bauer, 1972) to be added

(e) 6 SEPTEMBER 1979 "Kempsey" earthquake:

(i) Reference (Rynn and Lynam, 1981) to be added.

I am currently doing a write-up for each of these events and you'll have these soon (if the typist hasn't crucified me in the meantime!). Copies of my Great Barrier Reef paper included as per your request. So for now cheers and beers - more beers than cheers after this!

All the best

Dr. J.M.W. Rynn
Research Fellow in Seismology

https://doi.org/10.1785/0120240029

AUSTRALIA

Department of National Development & Energy

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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In reply please quote: 81/538

28 October 1981

Dr J.M.W. Rynn
Department of Geology & Mineralogy
University of Queensland
ST LUCIA Qld 4067

Dear Sir

BMR Bulletin 214 - ATLAS OF AUSTRALIAN ISOSEISMAL MAPS

The text of this Bulletin, which describes all major felt earthquakes recorded in Australia since European settlement began, is now with the editors.

... The authors would like to include the attached extract(s) in the text. Full acknowledgement will, of course, be made in the text. I therefore seek your permission to include the material, in which you hold copyright, in BMR Bulletin 214.

A similar letter ~~has been~~ will sent to your publisher.

Yours faithfully

[redacted]

for (R.W.R. Rutland)
Director

Jack, Could you treat this request individually — don't know the reference

Jan.

1979 ab SCOTT ILLAWARRA isoseismal maps + earthquakes

https://doi.org/10.1785/0120240029

Draft. Leaded paper

ISOSEISMAL MAPS OF QUEENSLAND EARTHQUAKES DRAFTED FOR BMR ATLAS

STATUS AS AT

(a) Those included in "Draft BMR Isoseismal Atlas" (as given to us by Ron Smith 2.3.79)

1918	JUN 06	"QUEENSLAND" EQ.	— redrafted by Egan (1981); this "original" superceded and to be deleted
1935	APR 12	CAMNDAH EQ.	— 2 comments and reference to be added to original
1947	JUN 11	MARLBOROUGH EQ.	— Reference to be added to "original"
1960	NOV 17	MT. CLORIOUS EQ.	— Reference to be added to the "2 originals"

(b) Maps sent early 1981 for drafting

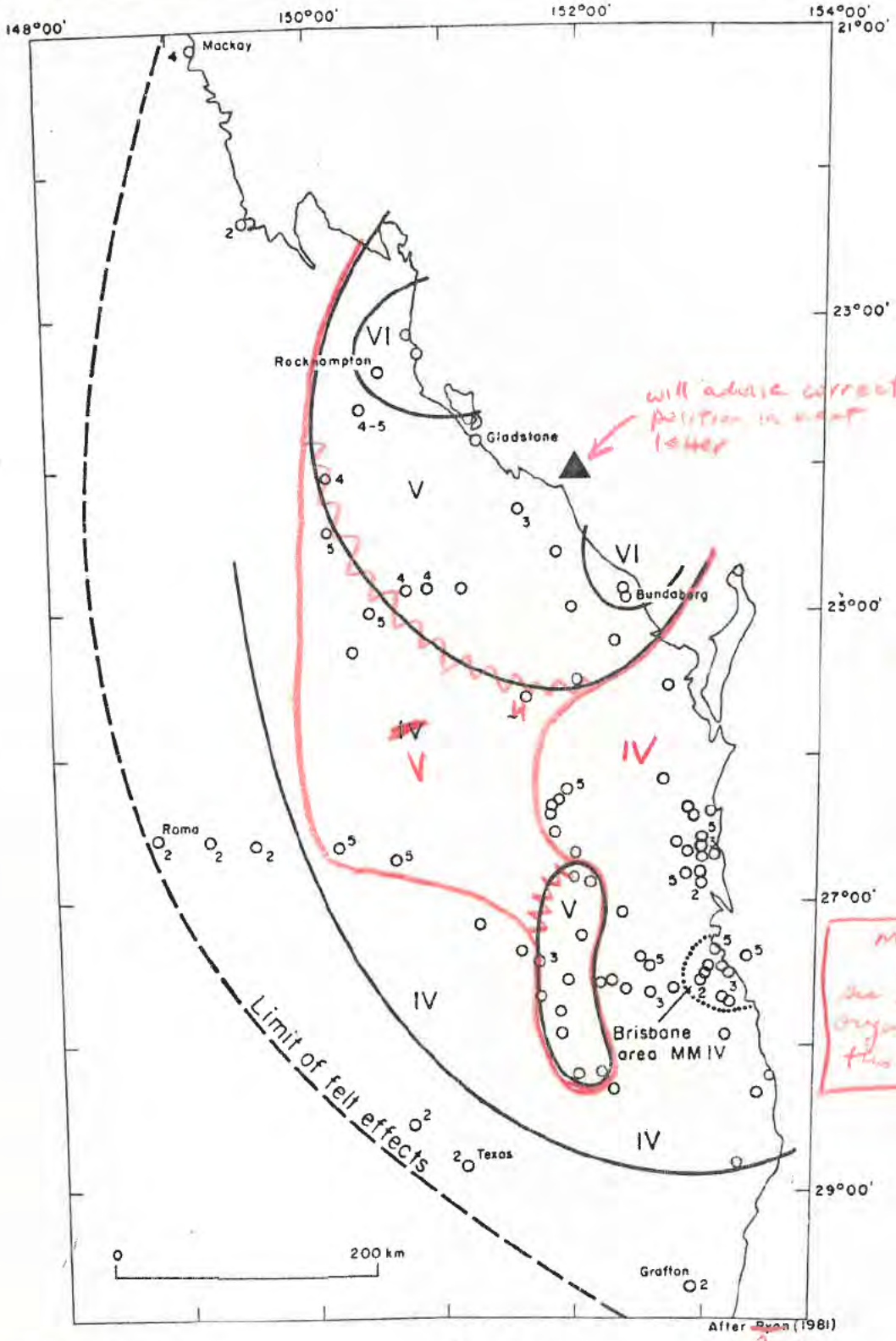
1979	SEP 06	KOMOSEY EQ.	— Reference to be added to "original"
1918	JUN 06	"QUEENSLAND" EQ.	— redrafted (final) version
1950	APR 05	MACKAY EQ.	
1950	JUN 19	ATHERTON EQ.	
1954	MAY 04	MOURILYAN EQ.	
1958	DEC 01	CAIRNS EQ.	
1978	APR 26	ESK EQ.	
1978	NOV 28	CAPRICORNIA EQ.	
1978	DEC 04	SPRINGSURE BURST	— 2 maps

to IBE

As sent

30.10.81

https://doi.org/10.1785/0120240029



24/Q/1

https://doi.org/10.1785/0120240029

[Digital ... draft map enclosed]

Other isoseismal maps references in the corresponding letter are not shown

https://doi.org/10.1785/0120240029

T

UNIVQLD AA40315
BUROMIN AA62109

BUROMIN

TO: DR JACK RYNN GEOLOGY DEPT UNIV OF QUEENSLAND
FM: IAN EVERINGHAM BUROMIN CANBERRA

THANKS FOR INFORMATION RECEIVED TODAY. PROPOSE TO ADOPT ALL YOUR SUGGESTED DRAWING AMENDMENTS BUT URGNETLY REQUIRE 1918 EPICENTRE FOR 'QUEENSLAND' EARTHQUAKE SO THAT I CAN SUBMIT WORK TO DRAWING OFFICE BEFORE I RETIRE TO PERTH NOVEMBER 18. LETTER WITH ANSWERS TO YOUR QUERIES WILL FOLLOW.

UNIVQLD AA40315

LA 9-11-81 205

UNIVQLD AA40315
BUROMIN AA62109M

UNIVQLD AA40315

BUROMIN AA62109

TO: UNIVQLD DEPT OF GEOLOGY
FM: DIRECTOR BUROMIN CANBERRA

ATTENTION: J. RYNN
ACTION OFFICER: DENHAM
MESSAGE NO: 169

==========

PLEASE ADVISE ORIGIN OF ML ESTIMATES FOR CAIRNS 1958 AND ESK 1978 OF 5.3 AND 4.0 RESPECTIVELY. THEY BOTH SEEM TOO LARGE.

https://doi.org/10.1785/0120240029

2-11-81

Addendum:

Ian, I received today just as I was about to mail this package, the letter from Professor Rutland re our permission to publish the Kingaroy earthquake extract in the BMR Bulletin. There are several points that have arisen because of this some of which leave me a little confused.

1) A reply has been sent to Prof. Rutland with the obvious permission granted — I have made it a blanket permission to cover all isoseismal maps, extracts etc from us to you now and in the future.

2) This brings up our request of permission from Director, BMR to be allowed to publish the maps which your people have drafted. Although you said this in a past letter (with the usual acknowledgements in the paper) should I write formally to the Director asking such permission or does your word hold?

3) Now to the format of these 'write-ups' that accompany each isoseismal map. As I have said before I thought it was a great idea (indeed essential!) and obviously you have returned the idea.

I have begun to prepare the "write-ups" for the 6 earthquakes I've sent you plus the 1935 and 1947 events which had maps in the preliminary copy of the Atlas Ron gave me. These are being prepared on the format of that for the 1973 Picton earthquake in the Atlas.

However in Prof. Rutland's letter, the format for the 1979 Kingaroy earthquake is quite different and it is a direct quote of mine.

∴ Q: Do you want our write-ups in this fashion or as I based on the Picton one?

https://doi.org/10.1785/0120240029

I prefer the Picton-type [illegible] rather than a quote from m[illegible]

(ii) As to the write-ups themselves (being typed now — will get them off to you later this week), I have done the following:

paragraph 1: general description, origin, time and signature

paragraph 2: details of issuance & date

<u>Details</u>

<u>Reference</u>

* <u>Q</u>: Have I included sufficient, or too much, information for [illegible]?

* <u>Q</u>: Is the format ok — or do you want some "narrative" like your previous comm. for the Kingsley event?

Thus I have attached ~~[illegible]~~ Kingsley write-up with additions based on the format of Picton.

My apologies for the extended guff on this but we feel this data is vital and thus I want to get what you want straightened out at this early stage — so if the additional research maps are sent to you we have what you require.

John asked me to press on one point. In discussing constraints to [illegible] maps already drafted and returned for comment, we both reiterate that point in the accompanying letter that original maps should be reproduced by you as we send them. This pertains particularly to the 1918 "Old" and 1978 "[illegible]" [illegible]. Thus I reinforce my comments for you to change these back to our originals. Neither of us see any reason for such amendments to your "[illegible]" of the maps. Naturally there may be discussion on how we change them (hardly [illegible]!) [illegible] they are to be

https://doi.org/10.1785/0120240029

published in a paper we think that they should be drafted as the authors had done. However, this is not intended to prevent you from questioning our analyses (healthy and friendly manner !!)

Another point in reference to Prof. Holland's letter. It is obvious that the Atlas is well under way "in the hands of the editors". What is going to happen to maps enclosed and those for the future until they be included? Do you intend to have a "loose leaf" bulletin for additional maps as they come along? This latter point [illegible] is relevant to us as we have about [illegible] in preparation to send to you.

On the same point, the first paragraph of this letter considers "all major felt earthquakes in [illegible]". This brings up the question of inclusions, what about some older historic earthquakes we have found that are not in the BMR earthquake file? Indeed there are some important ones e.g. an 1883 event, about the same place as the 1918 "Gladstone" event with magnitude, based on felt reports in newspapers, almost as big).

We hope you haven't "jumped ahead of us" on the Queensland earthquakes — it's taking us a bit of time to get this together (as you well know!)

Well Ian, please bear with us. Answers to the above questions are important to us so that we get all this bloody lot to your group (when it should have been a long time ago).

Thanks a lot, all the best

Jack

https://doi.org/10.1785/0120240029

AUSTRALIA

Department of National Development & Energy

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

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In reply please quote: 81/538

9 August 1982

Dr J. Rynn,
Geology Department,
University of Queensland
ST LUCIA QLD. 4067

Dear Jack,

. . . We are returning the original isoseismal maps of some of the Queensland earthquakes in the Isoseismal Atlas.

The magnum opus is now with the printers and should be available later this year.

With best wishes.

Yours sincerely,

David Denham

https://doi.org/10.1785/0120240029

JMWR:YH

THE UNIVERSITY OF QUEENSLAND

DEPARTMENT OF GEOLOGY AND MINERALOGY
ST. LUCIA, QUEENSLAND, AUSTRALIA, 4067
- SEISMOLOGY GROUP -

20.10.82
9.2.83

ISOSEISMAL DATA AND MAPS FOR QUEENSLAND EARTHQUAKES

SUBMITTED TO THE BMR FOR ISOSEISMAL MAP ATLAS OF AUSTRALIA

This note serves to clarify the status of isoseismal maps for Queensland submitted to the BMR since your initial request through a letter from Mr. I.B. Everingham of 11 July 1980 (reference 77/957). Up till this present communication, such data was conveyed in two parts:

(a) In the "initial draft" of the Isoseismal Atlas, four (4) such maps were on file (with source reference):

- "QUEENSLAND" earthquake of 6 June 1918: source unknown, possibly Hedley, 1925 (?)
- "GAYNDAH" earthquake of 12 April 1935: from Bryan and Whitehouse Gayndah earthquake paper of 1937
- "MARYBOROUGH" earthquake of 11 June 1947: from Jones Maryborough earthquake paper of 1947
- "MT GLORIOUS" earthquake of 17 November 1960: from Bauer honours thesis (this department) in 1972.

For these events the following notes apply:

(i) There was considerable communication re the name of the 1918 event. I trust that we convinced BMR, primarily Ian Everingham, that the name should be "QUEENSLAND" and not as he suggested either Bundaberg or Heron Is. The reason was simply that in all discussions, both published and ubpublished, it has and still is referred to as the "QUEENSLAND" earthquake (unfortunate but indeed the case).

(ii) I cannot find any descriptions (that is, the accompanying page for each event in the Atlas) for these four events. I can only presume that the BMR has written these themselves based on the original papers. If however, you require us to compile a description then please advise.

(iii) For the 1918 event, an upgraded map was forwarded in the second batch of isoseismal data and I believe it is this map (from the paper by Rynn, 1982 discussing this event in detail) that is now included in the Atlas.

(b) The second batch of data included:

- "QUEENSLAND" earthquake of 6 June 1918 (revised data and map)
- "MACKAY" earthquake of 5 April 1950
- "ATHERTON" earthquake of 19 June 1950
- "MOURILYAN" earthquake of 4 May 1954

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"CAIRNS" earthquake of 1 December 1958

"ESK" earthquake of 26 April 1978

"CAPRICORNIA" earthquake of 28 November 1978

"SPLITYARD CREEK BLAST" of 4 December 1978 (2 pages)

"KEMPSEY" earthquake of 6 September 1979

All of these included descriptions.

(c) Enclosed herein are the third batch of data which includes:

"DELUBRA" earthquake of 31 December 1951

"MARYBOROUGH" earthquake of 24 June 1952

"DAWES" earthquake of 7 February 1953

"MANY PEAKS" earthquake of 4 December 1953

"MANY PEAKS" earthquake (after shock) of 4 December 1953

"BIGGENDEN" earthquake of 22 September 1954

"MURGON" earthquake of 1 February 1955

"GAYNDAH" earthquake of 10 September 1955

"MUNDUBBERA" earthquake of 25 March 1964

"MUNDUBBERA" earthquake of 18 July 1967

"COALSTOUN LAKES" earthquake of 12 November 1975

For these earthquakes the data enclosed includes a list of places reporting (both positive and negative NF; with grazing properties denoted in inverted commas) with their corresponding MM value, original of an "initial" isoseismal map in BMR format (all maps are 1:1,000,000 topographic base) and a rough sketch isoseismal map (those drawn on same line). It is emphasised that many of the places mentioned are not on the 1:1,000,000 sheets nor on 1:250,000 sheets as such places (railway sidings, old homesteads; for example) do not exist today. Thus I suggest that you can find some of these on the Shell Road Map (enclosed) and on the old 1 Mile Military Maps. If you have problems in locating any of these places please advise and I shall attempt to assist. If it is suitable I would ask that you return the original 1:1,000,000 base isoseismal map to me as soon as you are finished with them. Also note that both EST and UT times are on the data sheets. For each description enclosed, the date on the heading and time in the details are given at UT. I have followed the BMR convention of naming the earthquake with reference to the nearest town where the maximum MM was reported.

[redacted]

Dr. John M.W. Rynn
Research Fellow in Seismology

9th September 1982

https://doi.org/10.1785/0120240029

Addendum

Also sent to BMR (David Denham)

"ST GEORGE" earthquake of 19 September 1954

"GOONDIWINDI" earthquake of 3 June 1965

https://doi.org/10.1785/0120240029

JMWR:RA

4 January, 1983.

The Director,
Bureau of Mineral Resources,
Geology and Geophysics,
P.O. Box 378,
Canberra City A.C.T. 2601

Attention Dr. David Denham

Dear David,

In this letter I am concerning myself with our contribution, to the BMR Isoseismal Atlas and enclose additional Queensland isoseismal maps and comments on your letters of 3 November, 1982 and 8 November, 1982. So as not to confuse ourselves, comments on other points in these two letters of yours will be made in a separate reply.

There is nothing I can add regarding the format for the isoseismal atlas - a map and separate page write-up are most apt for such a publication. There is one comment I would like you to consider for the future. I think that you should be prepared to send out corrections/amendments for any particular earthquake due to either (a) if new information comes to hand or (b) probably of more importance, if corrections are made to the source parameters due to further study on such a particular earthquake. I would think this necessitates the issue of a "revised" write-up page with the direction that it supercedes the previous page in the atlas. In our case this will be of particular impact primarily because of the references (e.g. Webb et at will now be published, hopefully, in 1983 and only then will we be able to give the complete reference; in fact this point is relevant for most Queensland earthquakes submitted).

The only other comment concerns the format of the write-up for each map. Your comments/guidelines on what information is required, how much to give etc would be useful. The "three-part" sectioning is excellent - it is really the first part of "general information" that could be better spelt out. Of course, now that the atlas is well underway this comment may be irrelevant. At least from our point of view, you know you have our blessing to change anything you want with our write-ups.

There are several attachments to this letter so that all is up-to-date with both of us.

A: Isoseismal Maps for Queensland Earthquakes:
This is a list of all available data for such maps. It represents a "file" of what has been sent to BMR under the following key:

0: Four isoseismal maps produced in initial Atlas. As far as I am aware more of these have write-ups, unless you have done so yourself (if so, could I please have a copy for our files to make

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them complete). Note that, for the 1918 "Queensland" earthquake a revised version was done by me with accompanying write-up; see 1 next).

1: Eight isoseismal maps complete with write-ups sent to IBE, my letter of 12 February, 1981. At this point the 1979 Kempsey earthquake is not included in the discussion - see later in letter under northeastern N.S.W. events (I have separated the Qld and N.S.W. groups for our own purposes).

2: Thirteen isoseismal maps complete with write-ups sent to you, my letter of 20 October, 1982.

3: Sixteen isosismal maps enclosed by this letter.

B: M(I) checks for earthquakes as per your letter 8 November, 1982: A sheet is attached with your original calculations and my checks. There are some differences but they are insignificant. As the Rp(MM=111) values are very approximate I feel they should be to the nearest 5 or 10 km and do not see the significance of, for example, Rp = 71km in the 1953 Many Peaks earthquake. Other comments are on the enclosed sheets which cover your additional questions.

C: Isoseismal maps for northeastern N.S.W. earthquakes:
The list for all available data we know of is enclosed. Only the 1979 Kempsey map has been sent to you - the others are currently being compiled.

Now a point of policy regarding use and publication of these isoseismal maps. I have asked before what is the BMR policy of using such BMR - drafted maps in a personal paper with due acknowledgment to BMR. This was the case with our Kempsey paper (see reprint). However, I have not had a definitive statement from you (and/or Director) in general for such republication. In particular for the Queensland events there are five papers in which I intend to put isoseismal maps. Details of these are enclosed for your information. There are, no doubt, several pros and cons with respect to both of us on this matter. From my point of view it seems a waste of time for the originating institution and the BMR to draft the same data twice. Also we have agreed that there should be a single format for maps of Australian earthquakes - so why have the BMR format in the Atlas and a "private" format in a paper? I suppose this could get out of hand with some people thinking the BMR is doing all the work while others may feel they want to be "sole author" for such a map. In our case it may be a bit different because we have so many maps to publish (over 100 years of data!) so that we can just get up to date. So to save a lot ot time it seems to me to be the best idea to use BMR format (i.e. the final Atlas maps) in our papers. Then for future earthquakes (seeing they would be one at a time) the institution would publish their own drawing then, at some later date, the Atlas would be added to with BMR drawn maps.

I freely admit that my request would save a massive amount of my time in drafting and so speed up the submission of such papers for publication. As you can see by the list we have quite a list of past data to publish. Hence David, I request you advise on this matter as soon as possible - what are your comments on my idea? Do you have further comments /suggestions? What is BMR policy? If BMR agrees what form should the acknowledgement take?

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https://doi.org/10.1785/0120240029

On the same point, we have been asked to write a paper on Queensland earthquakes in a similar fashion to George Eiby's "Descriptive Catalogue of New Zealand Earthquakes". My intention is to make this into two papers "A Descriptive Catalogue of Queensland Earthquakes 1866 to 1982" and "Significant Queensland Earthquakes and their Isoseismal Effects". Both would be submitted to our departmental papers. The first is simply a description of those earthquakes for which data is available, a table of all Queensland earthquakes and the epicentral map. The second would be a complete list and maps of all earthquakes for which isoseismal data is available. Obviously there is the question posed in the previous paragraphs of reproducing BMR Atlas maps. There is also the second question of how the BMR (and for you) feel about doing the second paper. I admit it crosses the Atlas but we wish to make Queensland earthquake data available in one phase to interested persons in the state. Of course there is another way out - we jointly write a paper/record/bulletin under BMR auspices with an introductory text, list and epicentral map and then "staple" all BMR Atlas maps to the back of this. Again your council on this matter is requested.

As mentioned, other points not on isoseismal maps will come in another letter. Please consider the above carefully so that we can have a "policy" once and for all. If there are any questions on the enclosed isoseismal maps please contact me. Thanks for all David.

Kindest regards,

Yours sincerely,

Dr. J.M.W. Rynn,
Research Fellow in Seismology.

NOTE: Sixteen (16) draft isoseismal maps sent under separate cover in mailing tube direct to you.

Addendum: These are two additional earthquakes I just found : 1978 APR 26 ESK. I have found the BMR Atlas map for this but no write-up. Did I do one? If not, do you want one done? 1981 MAR 24 TENT HILL. I cannot find either a BMR map or write-up for this event. Do you have them? If not, should I send them in the next batch?

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(A)

ISOSEISMAL MAPS FOR QUEENSLAND EARTHQUAKES

CUB 62

					SENT TO BMR				
1875	NOV 11	MACKAY			3				
	NOV 24	WARWICK			3				
1877	FEB 26	IPSWICH			3				
1880	AUG 10	WARWICK			3				
1883	AUG 28	GAYNDAH			3				
	AUG 28	GAYNDAH (Aftershock)			3				
1891	JAN 05	ELDSVOLD			3				
1896	FEB 27	CAIRNS			3				
1910	NOV 24	MUNDUBBERA			3				
1913	MAY 01	KILCOY			3				
	DEC 18	RAVENSWOOD			3				
1918	JUN 06	"QUEENSLAND"			0, 1	(initial atlas / corrected by Ryan)			
1935	APR 12	GAYNDAH			0	(initial atlas)			
	JUN 01	GAYNDAH (Aftershock)							
	JUL 19	GAYNDAH (Aftershock)							
1942	APR 10	DAINTREE			3				
1947	JUN 11	MARYBOROUGH			0	(initial atlas)			
1950	APR 05	MACKAY			1				
	JUN 19	ATHERTON			1				
1951	DEC 30	DELUBRA			2				
1952	JUN 24	MARYBOROUGH			2				

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CUB 68

					SENT TO BMR				
1953	FEB 06	DAWES			2				
	DEC 03	MANY PEAKS			2				
	DEC 03	MANY PEAKS (Aftershock)			2				
1954	MAY 04	MOURILYAN			1				
	SEP 19	ST. GEORGE			2				
	SEP 21	BIGGENDEN			2				
1955	FEB 01	MURGON			2				
	APR 10	MT. STANLEY			3				
	SEP 10	GAYNDAH			2				
	DEC 01	MT. PERRY			3				
1958	DEC 01	CAMPBELLS			1				
1960	OCT 19	MACKAY							
	NOV 17	MT. GLORIOUS			0	(initial atlas)			
1963	MAR 28	INNISFAIL			3				
1964	MAR 25	MUNDUBBERA			2				
1965	JUN 03	GOONDIWINDI			2				
1967	JUL 18	MUNDUBBERA			2				
1975	NOV 12	COALSTOWN LAKES			2				
1976	SEP 22	GOLD COAST							
	OCT 01	DAWES			3				
1977	MAR 05	INGLEWOOD							

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CUB 88

					SENT TO BMR				
1953	FEB 06	DAWLES			2				
	DEC 03	MANY PEAKS			2				
	DEC 03	MANY PEAKS (Alternative)			2				
1954	MAY 04	MOURILYAN			1				
	SEP 19	ST. GEORGE			2				
	SEP 21	BIGGENDEN			2				
1955	FEB 01	MURGON			2				
	APR 10	MT. STANLEY			3				
	SEP 10	GAYNDAH			2				
	DEC 01	MT. PERRY			3				
1958	DEC 01	CAIRNS			1				
1960	OCT 19	MACKAY							
	NOV 17	MT. GLORIOUS			0	(Initial atlas)			
1963	MAR 28	INNISFAIL			3				
1964	MAR 25	MUNDUBBERA			2				
1965	JUN 03	GOONDIWINDI			2				
1967	JUL 18	MUNDUBBERA			2				
1975	NOV 12	COALSTOWN LAKES			2				
1976	SEP 22	GOLD COAST							
	OCT 01	DAWES			3				
1977	MAR 05	INGLEWOOD							

https://doi.org/10.1785/0120240029

CUB 62

					SENT TO BMR			
1978	APR 26	ESK			1			
	NOV 28	CAPRICORNIA			1			
	DEC 04	SPLITYARD CREEK BLAST			1			
1981	MAR 24	TENT HILL						

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(13)

AEDF ≡ BMR Aust. Eq. data file Printout

AS PER DD LETTER 8.11.82 (Ref: 81/538) 58

CHECKS FOR Rp AND M(I)

$M(I) = 1.01 \ln Rp\,(MM=111) + 0.13$ (McCue, 1980)

CUB 62

		DD CALCS		DQ RECHECK		COMMENTS
		Rp(km)	M(I)	Rp(km)	M(I)	
1951	DEZUBRA	45	4.0	45	4.0	(1) On original should have read $m_b = 4.6$ taken from AEDF (2) Note Epicentre and to on AEDF different to Jones (19 (3) Don't know where AEDF parameters come from (? (4) Have accepted Jones (1959) parameters (5) checked Rp and M(I) and agree with DD
1952	MARYBOROUGH	94	4.7	100	4.8	(1) again Original took $m_b = 5.0$ from AEDF; note that clear is also given $M_L(RIV) = 5.0$ (2) Don't know where AEDF got $m_b = 5.0$ from (? (3) Rp is difficult — I think at least 100 km and cannot see where "94" came from — I will accept my recalculation of M(I) = 4.8 (4) I believe the "best" magnitude should be $M_L(RIV) = 5.0$
1953	DAWES	35	3.7	35	3.7	(1) again original should have read $m_b = 4.5$ taken from AEDF (2) note again difference to Jones (1959) epicentre and to in AEDF — I have taken Jones' parameters (3) Also don't know where AEDF parameters came from (??) (4) In calculation of M(I) the Rp (whether it be 30 or 35 km doesn't matter) gives an M(I) LESS THAN 4.0 — I do not think McCue's formula is relevant below 4.0 — see letter accompanying !!
1953	MANY PEAKS	71	4.5	70	4.4	(1) AEDF gives epicentre same as Jones but to different — have taken Jones (1959) (2) again where AEDF $m_b = 4.6$ comes from unknown — on original should have been $m_b = 4.6$ (3) M(I) calculation not much different to yours
1953	MANY PEAKS M/S	42-3.9		40	3.8	(1) I have estimated ML about 4.0 (2) Again M(I) would be questionable being less than 4.0

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(2)

CUB 62

		DD CALC'S		UG RESTECK		COMMENTS
		Rp (km)	M(I)	Rp (km)	M(I)	
1954	ST. GEORGE	210	5.5			(1) Can't calculate Rp nor M(I) as I have not kept a copy of the isoseismal map (you have it) (2) again AEDF gives an mb from unknown source (3) parameters taken from Jones (1959) with magnitude from AEDF
1954	BIGGENDEN	42	3.9	40	3.8	(1) Same comment re Rp → M(I) < 4.0, I estimate on ML about 4.0 (2) NB error in writing up to isoseismal maps in EQ reads 21 HOURS should read 20 HOURS !!! (3) Note difference in parameters used epicentre between AEDF and Jones (1959) — I used Jones
955	MURGON	30	3.6	30	3.6	(1) Same comment re Rp → M(I) < 4.0 (2) On original I should have put mb = 4.5 (NOT ML) taken from AEDF (3) Corrections to original sheet with isoseismal maps (a) date SHOULD read 1 FEB (NOT 2 FEB) (b) epicentre SHOULD read for E lag 152.2 (not 152.0) (4) AEDF longitude WRONG! SHOULD read 152.2 (not 151.2) (5) Again don't know where AEDF mb = 4.5 come from (??)
1955	GAYNDAH	25	3.4	—	—	(1) Rp is difficult to estimate (also M(I) could be < 4.0) — I have chosen to "estimate" on ML about 3.5 (2) Note difference between AEDF and Jones (1959) parameters — I have chosen Jones to and re-estimated epicentre based on isoseismal maps and chosen my own value
1958	CAIRNS	NOT LISTED		90	4.7	THIS EVENT NOT LISTED BY DD BUT NEEDS COMMENT (1) There are uncertainties in magnitudes: Isoseismal map gives ML 4.4 — from where ?? Write-up to this map gives ML 5.3 — don't know? AEDF gives mb = 5.0 from where ? (2) Thus I have estimated Rp and hence M(I) for this event

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CUB 62

Year	Place	DD CALCS Rp(km)	DD CALCS M(I)	WR RECHECK Rp(km)	WR RECHECK M(I)	COMMENTS
1964	MUNDUBBERA	75	4.5	75	4.5	(1) looks OK! (2) parameters taken from AEDF (3) NB CORRECTION TO ISOSEISMAL MAP Should read 5 at MUNDUBBERA Town as there was damage to buildings. And so with a V circle (albeit dashed ?) around MUNDUBBERA PLEASE CORRECT !!!
1965	GOONDIWINDI	167	5.3			(1) can't calculate Rp nor M(I) as I have not kept a copy of the isoseismal map (you have it) (2) parameters taken from AEDF (as reformed from ISC)
1967	MUNDUBBERA	45	4.0	45	4.0	(1) I originally took an estimate of ML = 4.0 for this event — I agree with your Rp and hence M(I) (2) For epicentre I have estimated it from isoseismal map
1975	COULSTOWN LAKES	17	3.0	—	—	(1) Again Rp → M(I) < 4.0 so estimated an ML at 3.5 (2) Epicentre estimated based on isoseismal map

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ISOSEISMAL MAPS FOR NORTHEASTERN NSW EARTHQUAKES

CUB 62

					SLANT TO BMR				
1938	JUN 27	ARMIDALE/GUYRA							
1959	OCT 12	URALLA/TAMWORTH							
1973	JUL 29	DORRIGO							
1979	SEP 06	KEMPSEY			1				
1980	SEP 04	ASHFORD							
1981	OCT 11	GLEN INNES							
198[illegible]	MAR 04	INVERELL							
	JUN 08	GLEN INNES							
	JUN 09	GLEN INNES							
	JUL 05	GLEN INNES							

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USE OF BMR ATLAS ISOSEISMAL MAPS FOR QLD EARTHQUAKES IN RESEARCH PAPERS FOR JOURNALS

1: NORTHEAST QUEENSLAND (Ryan and Heidecker)

Title: Seismic, Geomorphic and Structural Evidence for Neotectonism in Northeastern Queensland — Recent Implications (in preparation for submission to G.S.A.)

1875 Mackay; 1896 Cairns; 1913 Ravenswood; 1942 Daintree; 1950 Mackay; 1950 Atherton; 1958 Cairns; 1960 Mackay; 1963 Innisfail

2: WIVENHOE DAM (Ryan and Webb)

This paper is being contemplated but a proposed title is: Precipitating Seismicity Related to the Construction of the Wivenhoe Dam in Southeastern Queensland.

1877 Ipswich; 1913 Kilcoy; 1955 Mungon; 1955 Mt. Stanley; 1960 Mt. Glorious

Note: 1978 Eq and 1981 Tent Hill have been submitted to Dept. papers for publication.

3: NORTHEASTERN NSW (Ryan and Lynam)

Title: The Seismicity of Northeastern NSW with Details of the Recent Earthquakes at Ashford (1980), Glen Innes (1981, 1982) and Inverell (1982). (in preparation for submission to G.S.A.)

1938 Armidale/Guyra; 1959 Walcha/Tamworth; 1973 Dorrigo; 1980 Ashford; 1981 Glen Innes; 1982 Inverell (two), Glen Innes (three).

Note: (a) the 1959 Kempsey already published (Ryan-Lynam, 1982)
(b) Isoseismal maps for 1980 Ashford, 1981 Glen Innes (plus separate town map) and 1982 Inverell

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have been completed ready for photographing.

4: WIDE BAY – BURNETT (Ryan)

I am contemplating this paper after writing a report for an engineering consultant on the subject last year. A tentative title is:

Seismicity of the Wide Bay – Burnett District of Central Eastern Queensland.

1891 Eidsvold; 1910 Mundubbera; 1951 Delubra; [redacted]
1952 Maryborough; 1953 Dawes; 1953 Many Peaks;
1953 Many Peaks A/S; 1954 Biggenden; 1955 Murgon;
1955 Gayndah; 1955 Mt. Perry; 1964 Mundubbera;
1967 Mundubbera; 1975 Coalstoun Lakes; 1976 Dawes

Note: (a) The following isoseismal maps previously published
1935 Gayndah (Bryan and Whitehouse, 1938)
1947 Maryborough (Jones, 1948)

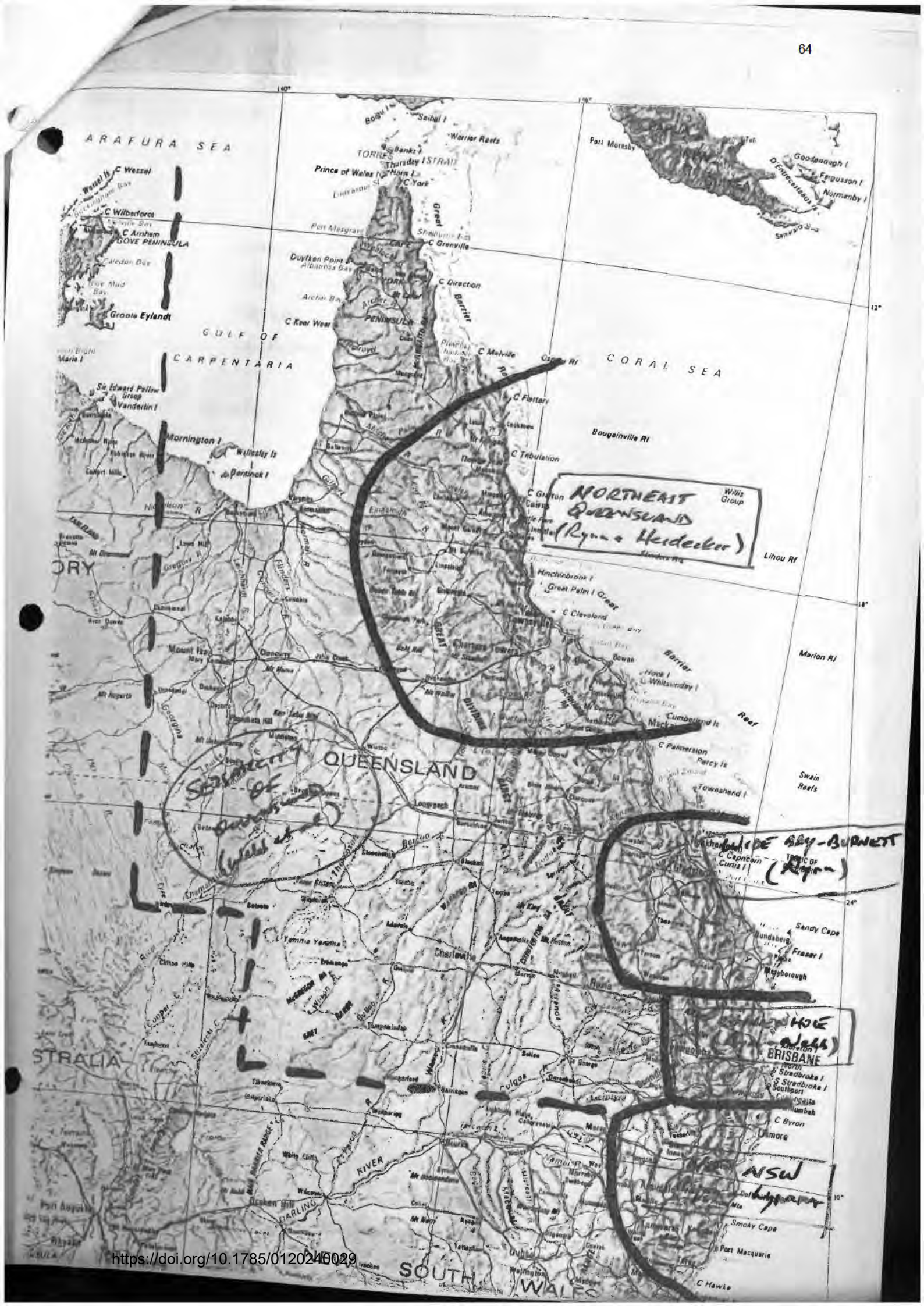
(b) The following isoseismal maps will be in separate papers:
1918 "Queensland": Ryan (in prep.) – A reappraisal of Queensland's largest Earthquake, the "Queensland" Earthquake of 6 June 1918, ~~Magnitude~~ $M_L = 6.2$ (Dept. papers)

1935 Gayndah with its 2 aftershocks:
Ryan (in prep) – The Aftershock Sequence of the 12 April 1935 Gayndah Earthquake (Dept. papers)

1883 Gayndah with its aftershock:
Ryan (in prep) – The 1883 Gayndah Earthquake and its Non-Relationships to the Krakatoa Volcanic Eruption (Dept. papers)

1978 Capricornia: Ryan, Webb and Flood (in prep) – The Capricornian Earthquakes of 28 November 1978 – An Initial Study of a Passive Continental Margin (Geol. Res. Letters)

https://doi.org/10.1785/0120240029



https://doi.org/10.1785/0120240029

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS
CNR CONSTITUTION AVENUE AND ANZAC PARADE, CANBERRA
Postal address: P.O. Box 378, Canberra City, A.C.T. 2601
Please address all communications to the Director
Telephone: 49 9111
Telegrams: BUROMIN
Telex: 62 109

Department of National Development and Energy

In reply please quote: 81/538

20 January 1983

Dr J.M.W. Rynn,
Department of Geology and Mineralogy,
The University of Queensland,
ST LUCIA, QLD., 4067

Dear Jack,

Thank you for your latest batch of maps. These are being processed with the ones you sent earlier and I am hoping that in the next financial year we can go to press with a supplement to Bulletin 214.

I would also think that as you would have provided about three quarters of the maps, it would be appropriate for you to be the senior author.

The only change in format from the maps in Bulletin 214 relates to the symbols used for the small towns. We will now use open squares rather than solid squares so that the intensity values can be superimposed properly.

There should be no problem in you using the maps in other publications but approval must be obtained from the Director for copyright requirements and suitable acknowledgements must be made in the paper. All you do is write to the Director listing which diagrams you wish to use and in this case we can probably supply you with the prints you will need.

Now a few minor points:

(i) The Split Yard Creek blast was not included in Bulletin 214 because it was not an earthquake.

(ii) The Goondiwindi map is being extracted from our system and will be sent to you in the near future (the drawing office is in Queanbeyan).

(iii) You sent us some hypocentral data some years ago for the first batch of earthquakes which do not agree with those on the recent maps - which are the best estimates? We should look at this when you are in Canberra.

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(iv) The Esk earthquake is included in the Atlas with a text from Rynn and Webb; the 1981 Tent Hill earthquake is unknown to me so please send the material down in the next batch.

Best wishes.

Yours sincerely,

[redacted]

DAVID DENHAM
Principal Research Scientist

P.S. The 1883 Gayndah earthquake (main shock) map was not in the batch you sent — can you send it down please

DD 20/1

Telegram

Have found this map

OK

https://doi.org/10.1785/0120240029

BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

CNR CONSTITUTION AVENUE AND ANZAC PARADE, CANBERRA
Postal address: P.O. Box 378, Canberra City, A.C.T. 2601
Please address all communications to the Director

Telephone: 49 9111
Telegrams: BUROMIN
Telex: 62 109

Department of National Development and Energy

In reply please quote: 81/538

3 February 1983

Dr J. Rynn,
Seismology Group,
Department of Geology and Mineralogy,
University of Queensland,
ST LUCIA, QLD., 4067.

Dear Jack,

This is to acknowledge receipt of the following isoseismal maps:

Tent Hill, 1981
Scartwater, 1978
Inglewood, 1977
Dorrigo, 1973
Mackay, 1960
Uralla/Tamworth, 1959
Armidale/Guyra, 1938
Gayndah aftershocks (2), 1935 and
Bundaberg (Queensland) aftershocks (2), 1918.

The hypocentres for the Inglewood and Dorrigo earthquakes are in need of major revision. A quick examination shows that in both cases all the data were not used in the computations.

Copies of the maps will be sent back under separate cover and we will await your descriptions.

Best wishes,

Yours sincerely,

[redacted]

David Denham

https://doi.org/10.1785/0120240029

JMWR:YH
7th February, 1983

The Director,
Bureau of Mineral Resources, Geology and Geophysics,
P.O. Box 378,
CANBERRA CITY A.C.T. 2601

Attention: Dr. D. Denham (Seismology)

Dear David,

Thanks for your letter of 3.2.83 (Ref: 81/538). Your comments re Inglewood and Dorrigo earthquake locations are well taken. We now ask what additional data there is and request, if possible, for you to send to us and we'll relocate.

An omission from my last letter re offer of senior authorship on next altas bulletin - I am obviously overjoyed at this suggestion.

All the best,

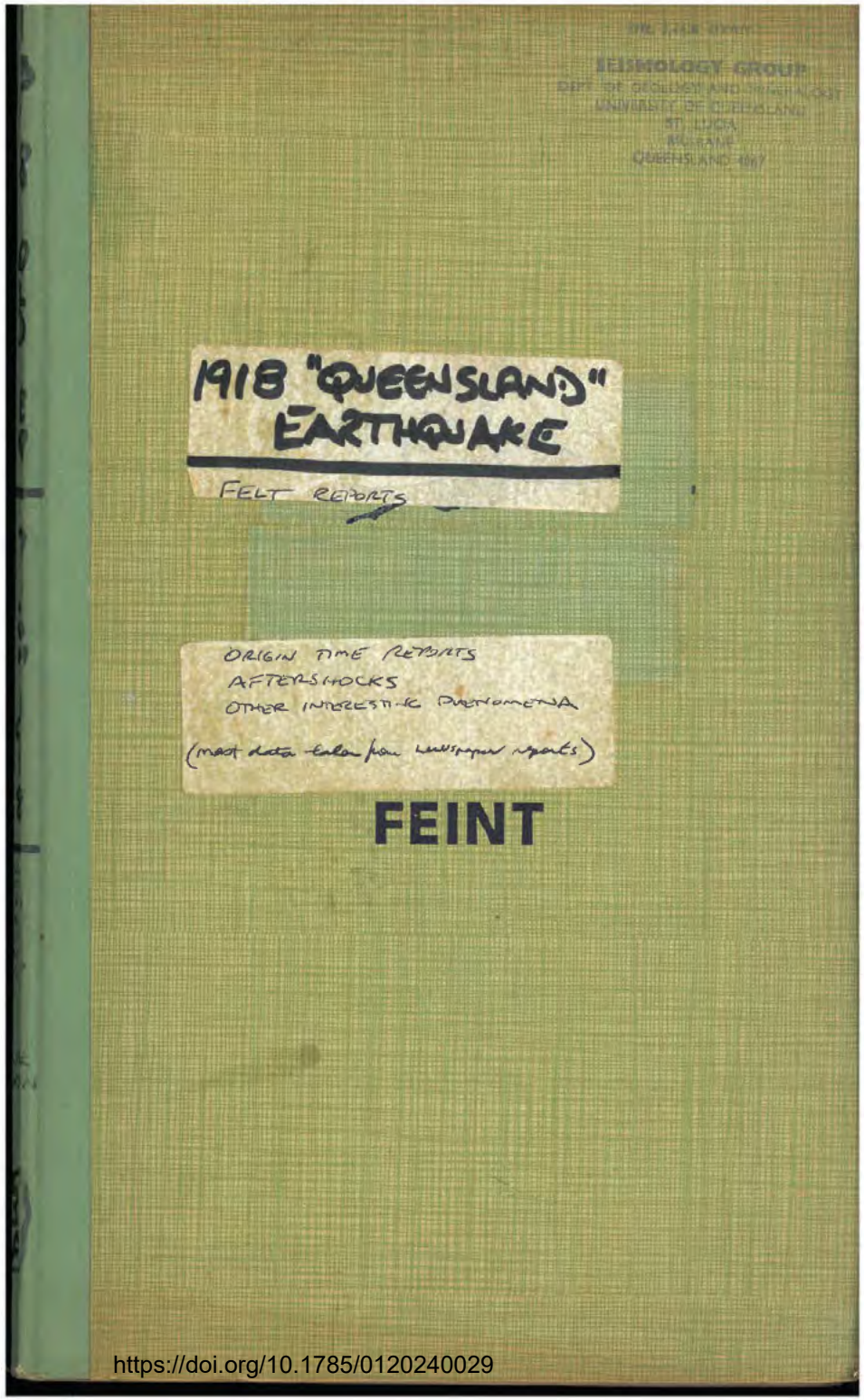
Dr. J.M.W. Rynn
Research Fellow in Seismology

https://doi.org/10.1785/0120240029

Supplementary Material 5 – Jack Rynn's workbook for 1918

This section presents Jack Rynn's workbook for the 1918 earthquake that tallies places where the earthquake was felt along with newspaper references for these locations. It also tallies Modified Mercalli Intensities for those locations assigned by Jack Rynn.

https://doi.org/10.1785/0120240029



https://doi.org/10.1785/0120240029

In this section all blank pages are intentional.

Alphabetical sections without place names are indicated.

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ST. LUCIA
BRISBANE
QUEENSLAND 4067

MACROSEISMIC DATA — NW — SW — WNW

- ✓ Hedley (1925) — St Lawrence – Tambourine – Roma
- ✓ "The Brisbane Courier" 8,18.6.18 — St. Lawrence – Nth Rivers NSW – Roma
- ✓ "Daily Mail" 8.6.18 — St Lawrence – Warwick – Goondiwindi
- ✓ "Telegraph" 7,8,10.6.18 — St Lawrence – Tambourine Mt – Roma
- ✓ "Queenslander" 15.6.18 — { St Lawrence – Nth Rivers NSW – Roma; no specific data – only general quotes from "Courier" }
- ✓ "Gympie Times and Mary River Mining Gazette" 8,15.6.18 — Southern and central Qld, northern part of NSW; St. Lawrence – Grafton – Roma
- ✓ "Truth" 16.6.18 — mentioned only Rockhampton – typical "Truth" stupid comment
- ✓ "Rockhampton Morning Bulletin" 8,10.6.18 — St Lawrence – Tambourine Mt – Roma; Darling Downs district, Burnett district, central Qld
- ✓ "Rockhampton Daily Record" 7.6.18 — Mainly Rockhampton details
- ✓ Mackay "Daily Mercury" 8,11.6.18 — Quotes from Brisbane and Rockhampton papers – no new data
- ✓ Roma "Western Star" 8.6.18 — Roma district only
- ✓ Barcaldine "Western Champion" 8.6.18 — Small item with reference to Rockhampton and RIV
- ✓ London "Times" 7.6.18 — from their Sydney correspondent
- ✓ Wales (1978)
- ✓ Several private communications (obtained in 1977 and 1981) { ✓ Mr. Jeffrey; ✓ Bowen Historical Society; ✓ Q.A. Jones's files; ✓ Mrs Harrington...; ✓ Wynnum-Redlands Herald (3); ✓ Stanthorpe Border Post; ✓ Mr J. Kerr } event extended to CHARLEVILLE !!
- ✓ "The Brisbane Courier" 11.6.18 ⟹
- ✓ "Townsville Daily Bulletin" 8.6.18
- ✓ "Townsville Evening Star" 7.6.18

Communications through "Grassroot Historians" 1981

- ✓ "Bowen Independent" 11.6.18 — [illegible] – east of Keppel Bay
- ✓ "Maryborough Chronicle" 14.6.18
- ✓ "Daily Standard" { 7.6.18; 8.6.18 }

~~[illegible]~~

- ✓ Townsville "North Qld Register" 8.6.18
- ✓ Other private communications — ✓ Mr. Golding (Gladstone); ✓ Mrs. Holt-Smith (Herbert?); ✓ CM Scientific Station [illegible].4.81; ✓ Mrs Dwyer (Gladstone); ✓ Mr. CTS Watson (1947 of file report); ✓ from 1935 of reports on THEODORE, MONDURE, "[illegible]", [illegible], GAYNDAH, BRISBANE City
- ✓ Toowoomba "Chronicle" 8,11,13.6.18
- ✓ Bundaberg News 8.6.18 (from Mr. Harvey)
- ✓ Warwick "Argus" 8.6.18
- ✓ Warwick "Examiner" 8.6.18

https://doi.org/10.1785/0120240029

INTERESTING PHENOMENA — Reference

(1) Met Office Brisbane showed "8" vertical mark at 4.15 am (too early? ... = 0.3 [illegible] → ∴ time of arrival should be ...) (short [illegible] due to something ... BRS??) — COURIER 8.6.18

(2) Excellent account of effects in Rockhampton and district with full description of felt effects / damage on people / buildings — ROCKHAMPTON MORNING BULLETIN 8.6.18 (and) ROCKHAMPTON DAILY RECORD 7.6.18 ✓

(3) Felt on train: Western Mail train into Toowoomba; Train into Rockhampton at Wycarbah — COURIER 8.6.18; ROCKY. MORN BULL. 8.6.18

(4) Mt. Morgan mines fright effect on miners – at time – thought ∃ u/G explosion — ROCKY. MORN BULL 8.6.18 ✓

(5) Origin time: all about 4.15 am (4.15–4.20)
✓ Some definite times on clocks stopped as listed below:

(6) Aftershocks: MS + 2 distinct shocks at lots of places

(7) Rockhampton – earth fissures
Chimney stacks broken (VI–VII)
broken crockery etc
thrown out of bed

(8) QUOTE: "Earth tremor Appears" — DAILY MAIL 8.6.18
Some statements in paper to describe the most severely effected area in Rockhampton ✓

(9) Courier 11.6.18 – Russell Is. Hamer mound (F) ✓

(10) Courier 11.6.18 – "Roar" of sea on Stradbroke Is.
⟹ CHECK TIDE GAUGES!!! ✓

[Also Note: previous earthquake (?)
11 June 1917 — get "Courier" article!!

(11) Courier 11.6.18 — Mooloolaba Toorbul vessel "CLYDE" experienced a great swell!!

(12) NB Hedley (1925) only gives small paragraph to Rockhampton and Brisbane
but many pages to Carlisle and surrounding area !

(13) "Tidal wave" at Sandgate — "DAILY STANDARD" 7.6.18

(14) Very many reports speak of "great rush of wind" – throughout entire region!
Rockhampton "mysterious half-terrifying noise as of a cyclonic gale"
also distant audible rumblings accompanied shock
Roar from sea at Russell Is. (Cour 11.6.18) (Sealion F)

(15) Sandgate: "tidal wave" – sea rushed across foreshore (Daily Standard 7.6.18) —

PTO →

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Summary of Felt Intensities

(a) listing for number of reports
"one report defined as one given in each newspaper article"

(b) where "FELT" is given by newspaper take as min = III

(16) Slight [illegible] at Noosa Bay "TEWA CHRONICLE" 8.6.18

(17) Felt on tram at WINDSOR ([illegible]) ✓
"ROCK. MORNING BULLETIN" 8.6.18

(18) "Toowoomba Chronicle" reports on suburb of Newtown !!! ✓

⑧

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Effects in Rockhampton

Rock. Morn. Bull.

plaster off; large cracks in buildings; /
large tank burst at Kalka
people thrown out of bed at Kalka } KALKA – ~~[illegible]~~ severe?

Felt on tram at Wandal.

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(1)

University of Queensland

ST. LUCIA, BRISBANE, AUSTRALIA, 4067

Rushing ~~[illegible]~~ noise like a strong wind or gale (many towns) ✓

---

clocks stopped ✓

TWB – church thrown out of level ✓
– cracked floors
– passengers on Western mail Train felt it ✓

---

residents "thrown out of beds" ✓
Rocky dirt; Yardume.

Pile light — electric light swinging / clocks stopped } "Gympie Times" ✓

Tiaroom — shock loosened blocks of all buildings in the town ("Gympie Times") ✓

Page for locations starting with "A" missing from original

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B

VI	V	IV	III	FELT	II	NF

from STANTHORPE'S BORDER POST 1977

Columns: RIDLEY (1935) · COURIER 3.6.17 · DAILY MAIL · TELEGRAPH · GYMPIE TIMES · ROCKY. MORN BULL. · ROCKY DAILY RECORD · COURIER 11.6.18 · [illegible] · [illegible] · [illegible]

BANANA V — RIDLEY: V, 4.25 (+2 before 4.30) — [illegible]

BAFFLE CK (Golden [illegible] coast) V — COURIER 11.6.18: V, 4.35 am — 2 A/S; 3rd 5.45–5.50 am; 4th 6.15 am — [illegible]

BALGOWAN IV — IV

BOONLEIGH and district IV — IV

BEERWAH F — FELT, 4.15

[illegible] ~~ER[illegible]AM WEST CANDLE MT.~~

BIM BAM (Boulburra Central Railway) IV — IV, 4.30

BLACKBUTT V — ~~[illegible] 4.45~~ — III [illegible]; ~~[illegible]~~

BLUFF IV (Queen [illegible]) — IV — loud roaring noise from sea

BRISBANE IV–V — see separate page w.r.t. suburbs – overleaf.

BROADWATER (Stanthorpe) — IV

BUDERIM F — FELT, 4.30

Bowen IV NF — ~~IV ([illegible] case)~~ ? Don't know where I got this IV from ?; Bowen [illegible], definitely reports NOT felt. !!

Bundaberg [illegible] — [illegible] ("[illegible] Chronicle")

(?)

B C D E F G H I-J K L M Mc N O P Q R S T U-V W X Y

https://doi.org/10.1785/0120240029

HEDLEY (1935) | COURIER | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN. BULL. | ROCKY. DAILY RECORD | JACKS (1978) | Daily St... | BUNDABERG NEWS

BUNDABERG V
V–VI * | ~~FELT~~ FELT V–VI | FELT | IV | V | (V–VI) IV — ornaments thrown off shelves ✓
2 figurines [illegible] from [illegible]
clock stopped
Contents of vats at distillery [illegible]

(For Bundaberg)

VI	V	IV	III	FELT	II	NF
	✓✓✓✓ ← ✓✓✓ → ✓✓✓✓	✓✓		✓✓✓		

BRISBANE (IV–V)

HEDLEY (1935) | COURIER ... | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | DAILY RECORD Rocky. | PRIVATE COMM. ← Wynnum-Manly Herald, 1977 | [illegible] M.G. 18 | [illegible] | TOOWOOMBA CHRONICLE

(Summary of intensity reports are NOT PASSED !!)

Full details to be given * (V)

ASCOT — IV–V * 4.15am — badly shaken, pictures moved, jarring [illegible] ✓

BULIMBA FERRY — IV 4.15 to 4.20 — water in glasses moved to south. ✓

CITY (Wickham Tce) — IV–V (1935 [illegible] report)

CHERMSIDE — IV ✓

DARRA — IV ✓

EAGLE JUNCTION — IV — furniture moved ✓

EIGHT MILE PLAINS — IV ✓

MANLY — IV 4.18, IV, V, IV — crockery broken ✓

OXLEY — IV IV ✓

PILE LIGHT — V 4.17, V 4.17 — structure swayed, clock stopped ✓

[illegible] RUSSELL IS — See under "R" IV–V — "Daily Standard"

SANDGATE — IV — IV — people shaken in beds, "[illegible]" [illegible] washed away [illegible] ✓

SOUTH BRISBANE — IV ✓

WELLINGTON PT — IV 4.22, IV ✓

WOOLOWIN — IV, FELT ✓

WYNNUM — IV, FELT IV–V, V — crockery falling off shelves, [illegible] falling off [illegible] ✓

C D E F G H I-J K L M Mc N O P Q R S T U-V W X Y

https://doi.org/10.1785/0120240029

	VI	V	IV	III	Fcii	II	NF
Ascot		//					
Bulimba Ferry			✓				
Wellman City (Wellan Ter)			✓		✓		
Darra			✓		//		
Eagle Junction		✓	//		✓		
Eight Mile Plains			//				
Manly		✓	//		//		
Oxley			✓		///		
Pile Light		✓					
Redcliffe					✓		
Russell Is		✓	✓				
Sandgate			////		////		
South Brisbane			✓				
Wellington Point			✓	✓	✓		
Wolowin			/		//		
Wynnum		///	///		///		

It appears that mal = V, N-V (i.e. most instances) was reported for Bayside suburbs and northern suburbs adjacent.

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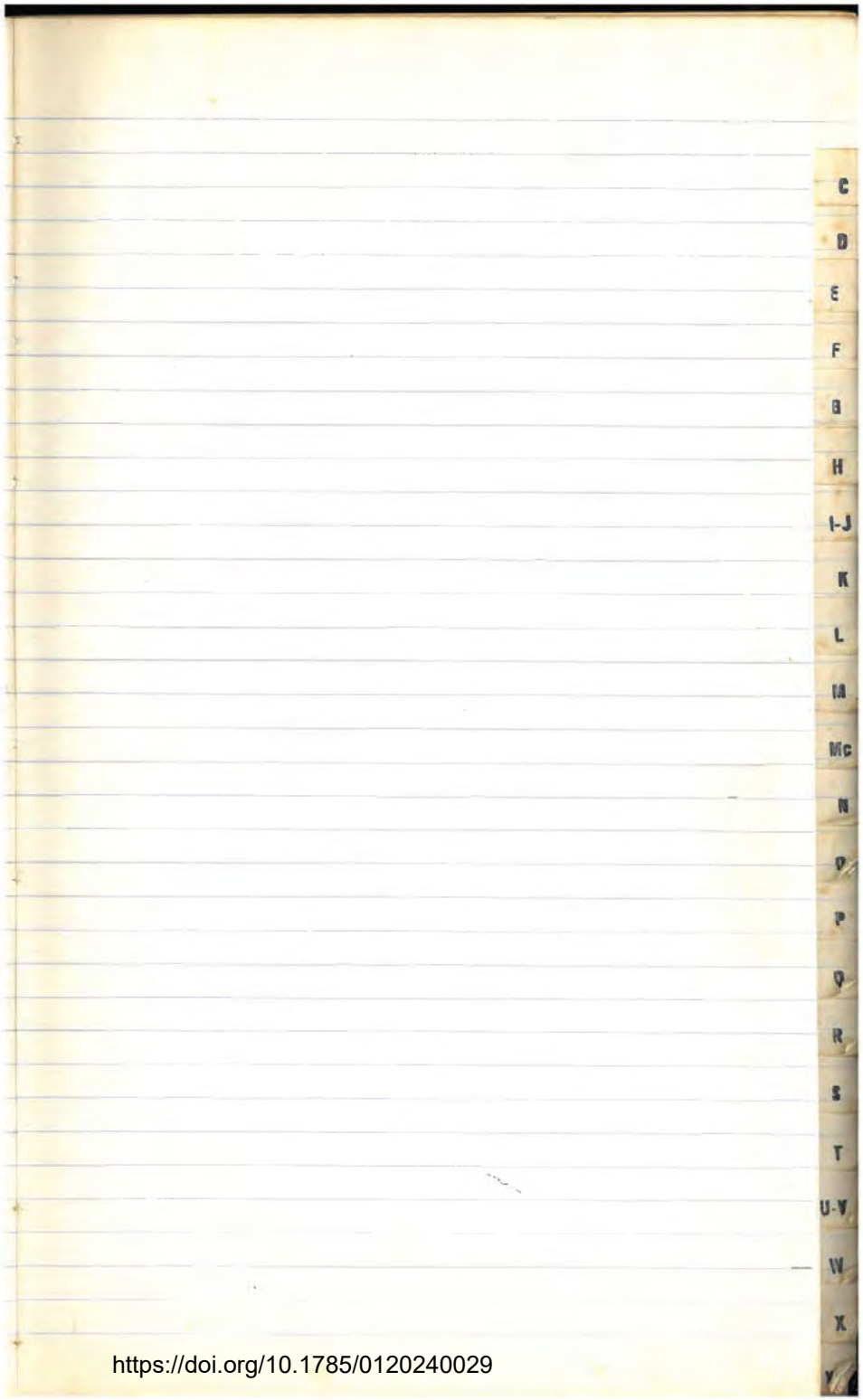

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VI | V | IV | III | FELT | II | MF

V ↩ | IV /

//

↩

/ /

↩// / /

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HEDLEY (1925) | COURIER 8.6.18 | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN BULL. | ROCKY DAILY RECORD | COURIER 11.6.18 | TOOWOOMBA CHRONICLE

CAMBOON V

V

1st report 4.15

4.45
4.35
4 between 4.35 and 9am
+ tremors all day

2nd report 4.15
7 before 9am
~50 all day
continual till 1.7.18
strong one 9.45am 1.7.18
10am 3.7.18
8.05pm 20.8.18
several more till 21,22,23.8.18

CAMBOOYA FELT [illegible] FELT ///

E ///

CHILLIVILLE and district /// [illegible] ✓

HHH //

CHILDERS and District V FELT — Crockery & glassware broken fowls knocked off perches inhabitants alarmed ✓

V

4.15
foreshock 1am
AS 5am

CHINCHILLA V FELT V clocks stopped (severe rattling) ✓

V

4.15

C D E F G H I-J K L M Mc N O P Q R S T U-V W X

	Hedley (1925)	Courier 8.6.18	Daily Mail	Telegraph	Gympie Times	Rocky. Morn. Bull.	Rocky Daily Record	Courier 11.6.18	Toowoomba Chronicle			VI	V	IV	III	Felt	II	N-F
CLIFTON and District V		V 4.20	FELT						✓	clocks stopped pictures thrown from walls crockery broken	✓		✓✓	✓		✓		
COOROY V		FELT ~~FELT~~	FELT		V 4.15			✓ 4.20		people alarmed	✓			✓		✓		
COOYAR IV			IV✓						IV					✓✓		✓		
CRACOW STATION HOMESTEAD IV	IV													✓				
CROHAMHURST V	V 4.16 (2 or 3 ... 4.30)										✓							
CROWS NEST V			✓ 4.15					V 4.15	V	people alarmed plaster in buildings cracked	✓		✓✓✓					

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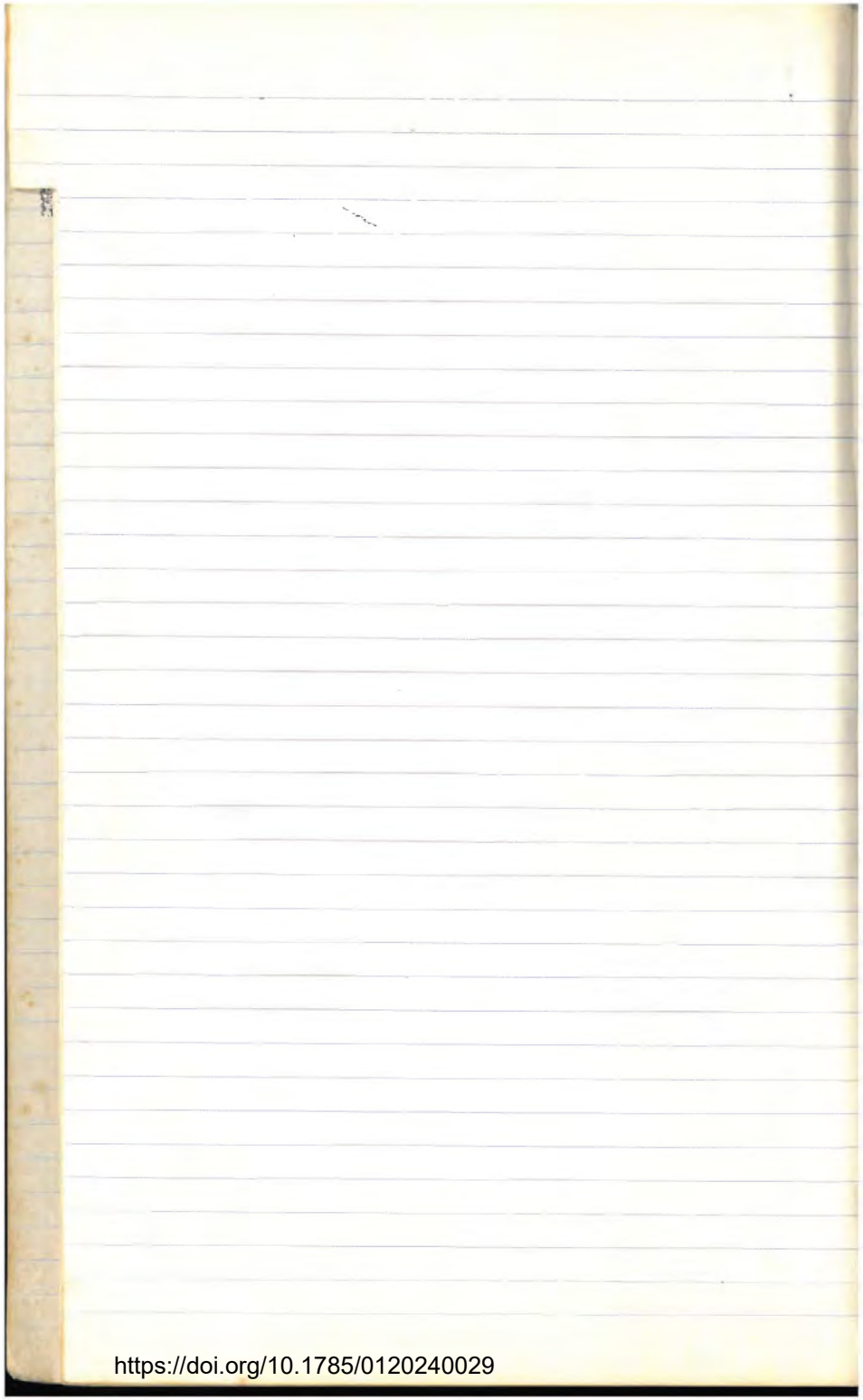

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VI	V	IV	III	FELT	II	NF
	✓			✓		
	✓✓					
	✓✓			✓		
				✓		
←✓→						
		←✓→				

	Herald (1935)	Courier	Daily Mail	Telegraph	Gympie Times	Rocky Morn. Bull.	Rocky Daily Record	Toowoomba Chronicle	Warwick Argus	Warwick Examiner		
DALBY F IV		FELT	FELT					IV				
DALVEEN									IV	IV		
DANDAROO		FELT							IV	[illegible]		✓
and District F		4.15 +2 M.S										
DAWSON VALLEY townships etc F					FELT							✓
DEGILBO (on Gayndah railway line) ✓	✓										Clock on [illegible] noted (from south to north)	✓
											[illegible] fell off [illegible] (from south to north)	✓
"DOONGAL" (21 [illegible] of Maryborough on Gayndah line)											III-IV 1935 eq reports	

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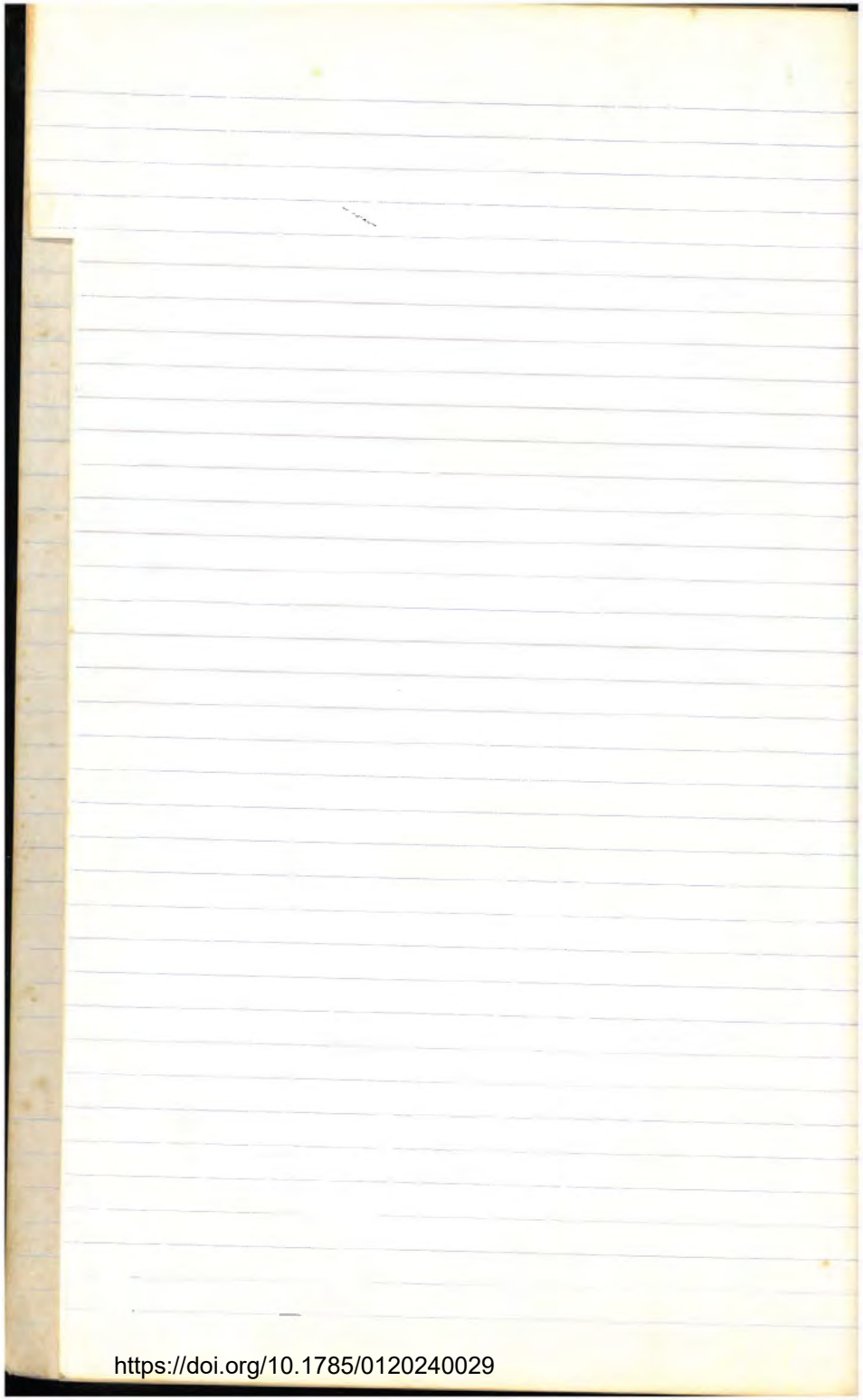

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VI	V	IV	III	FELT	II	I
		✓				
		✓				
		✓				
✓		✓				
				✓		
		✓				
		✓				

HEDLEY (1935) | COURIER 3.2.'18 | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN BULL | ROCKY DAILY RECORD | COURIER 11.6.18 | SUNDAY MAIL | DAILY STANDARD | TOOWOOMBA CHRONICLE

EMU PARK — V — (VI?) FELT — IV-V — IV-V 4.35 — FELT — furniture moved ✓✓

EVDLO — IV — IV ~4.30 — people alarmed severe rumbling of earth rattling ✓

EAGLEBY [redacted] — IV — III-IV ✓

ELLIOT (Bundaberg?) — IV, V ... ~

EMU CREEK — V — ✓ 4.15 — III

ESK — IV — IV ~4.30am — ... ✓

EUMUNDI — IV — IV 4am ✓

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No locations beginning with "F"

https://doi.org/10.1785/0120240029

G
H
I-J
K
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U-V
W
X
Y

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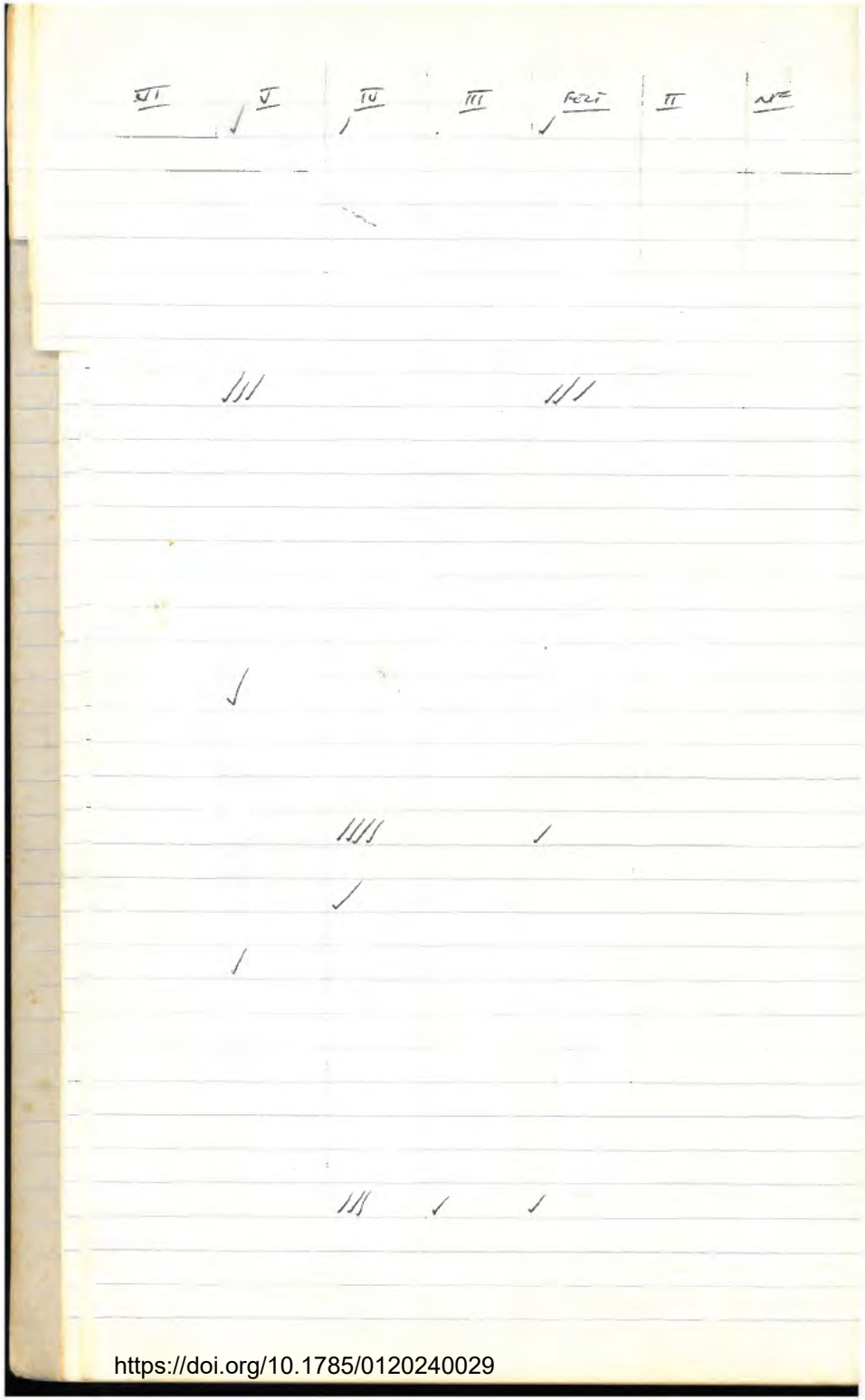

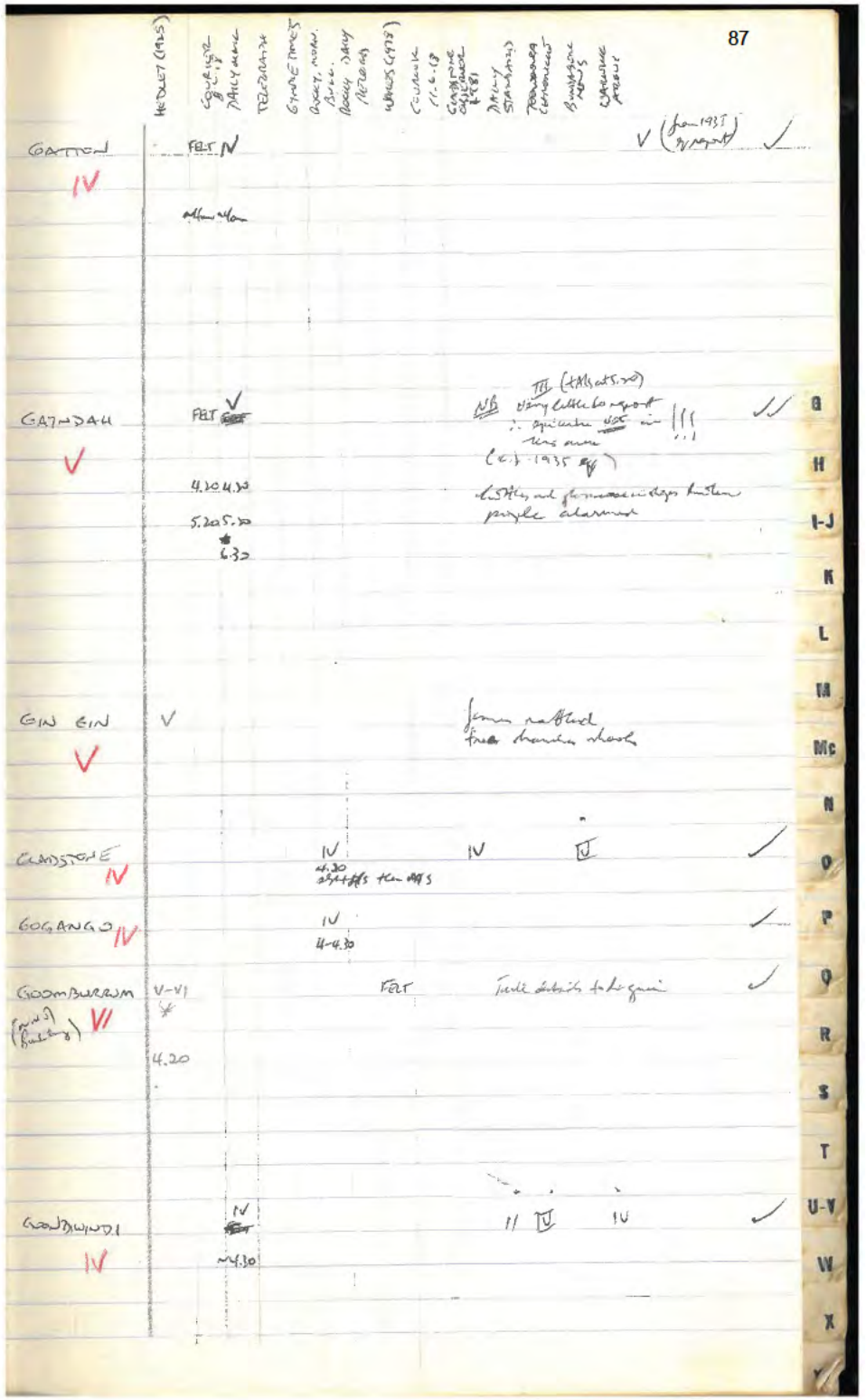

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	MEDLEY (1935)	COURIER 3.6.?	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	BOGGY ...	... DAILY	COURIER 11.6.?	DAILY STANDARD	TOOWOOMBA CHRONICLE			VI	V	IV	III	FELT	II	NF
GRAFTON & district III			FELT 4.45	FELT						III		✓					✓		
GRANTHAM IV		IV 4.17								III		✓			✓		✓		
GYMPIE and District IV			IV 4.15		IV 4.15			III 4 pm	IV		people alarmed	✓			///		✓		

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https://doi.org/10.1785/0120240029

VI	V	IV	III	RECENT	II	NF
/						/
	/					
[illegible]	/		/			

	Daily Mail	Courier 11.6.13		
HARRISTOWN	V			
V (suburb of Toowoomba)				
HALLAN "FERNYHURST" N	[illegible]	N 4.10am	[illegible] [illegible] violent	/
HOWARD		N, FOLT	[illegible] [illegible]	

H
I-J
K
L
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X

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https://doi.org/10.1785/0120240029

VI	V	IV	III	FELT	II	NF

	HEDLEY (1975)	COURIER	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	ROCKY MORN BULL	ROCKY DAILY RECORD	TOOWOOMBA CHRONICLE	
IMBIL F					FELT				
IPSWICH and District IV-V		IV 4.15						V	nothing D. beds slight explosion in mines

I-J K L M Mc N O P Q R S T U-V W X

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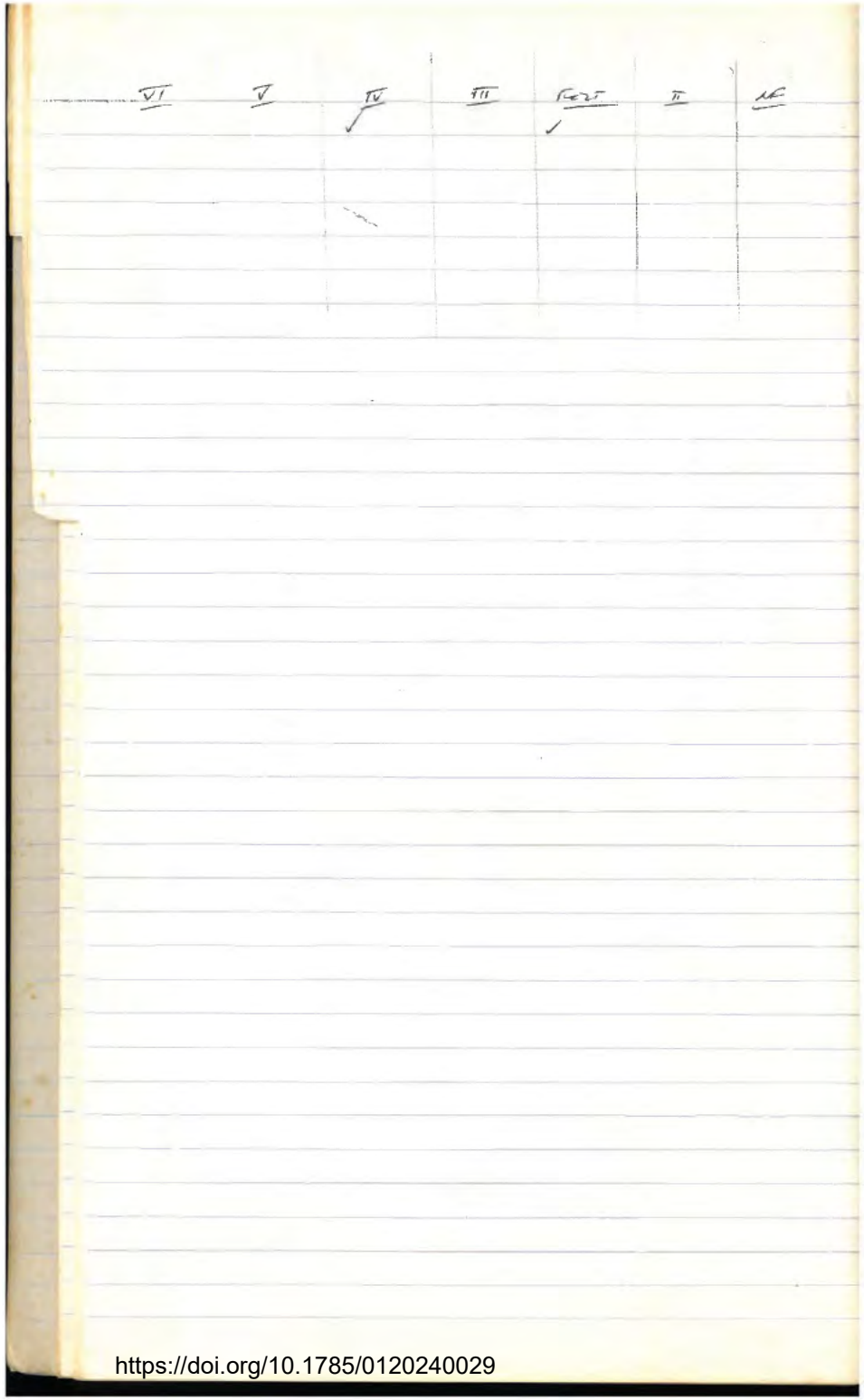

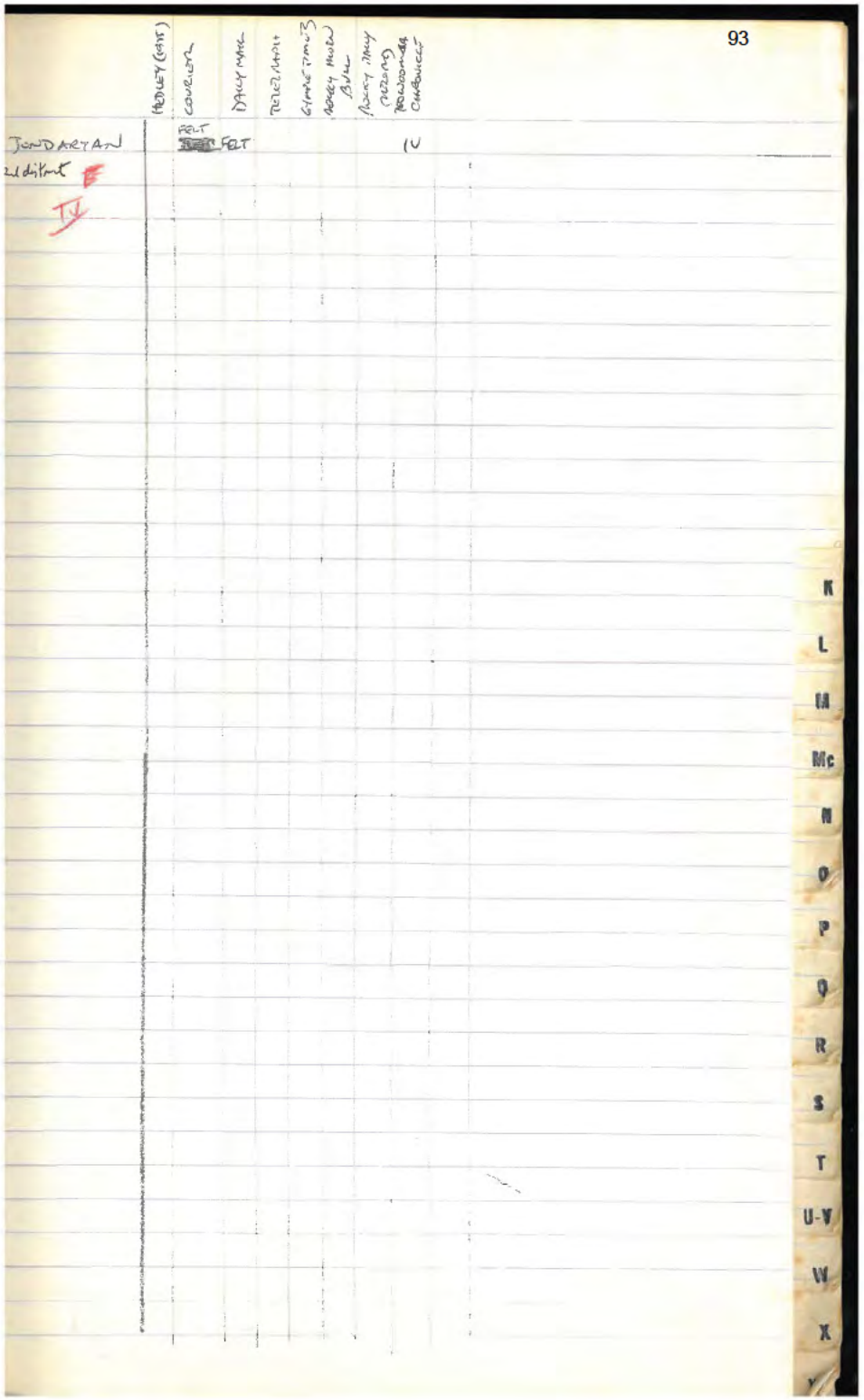

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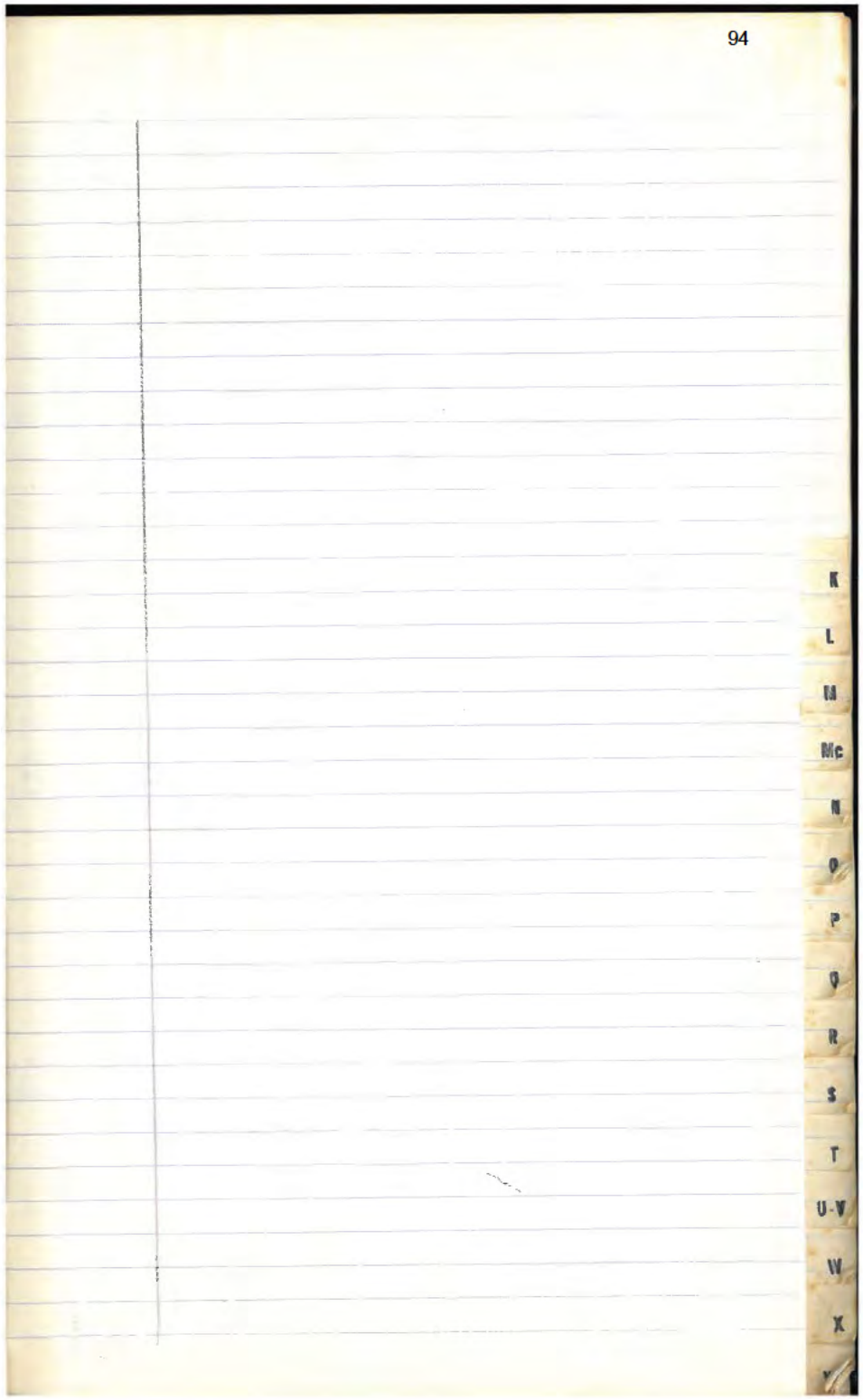

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VI	V	IV	III	FELT	II	I
/	//					
		//				
	//		//			
	//					

GAZETTE (1935) · COURIER · DAILY MAIL · TELEGRAPH · GYMPIE TIMES · ROCKY. MORN. BULL · ROCKY DAILY RECORD · [illegible] · TOOWOOMBA [illegible] · TOOWOOMBA CHRONICLE

KALKA — V–VI · VI — large tank burst
VI

KILLARNEY — IV · IV — ✓
IV
11am
+2 M/s

KINGAROY and district — FELT V · V — slapped doors, lights swaying, people alarmed, displaced pictures — FELT (1935 9 years) ✓
V
4.20 4/15
3am 1st shock
4.23
5-am

KOON GAL (near [illegible]) — V · V · V–VI — 2 people thrown out of bed ✓
4.30
✓

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029

VI	V	IV	III	[illegible]	II	[illegible]
			//	/		
	/					
		//				
	/					

	HEDLEY (HK)	COURIER	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	ROCKY. MORN. BULL.	ROCKY DAILY RECORD	TOWNSVILLE DAILY BULLETIN	TOOWOOMBA CHRONICLE		
LAIDLEY and district III		III .. III 4.20	4.20						III		✓
LAKES CK V						V				pictures full of white people alarmed	✓
LISMORE IV		IV 11am				IV 4am		IV 4am			✓✓
LOWOOD V			V 11am								

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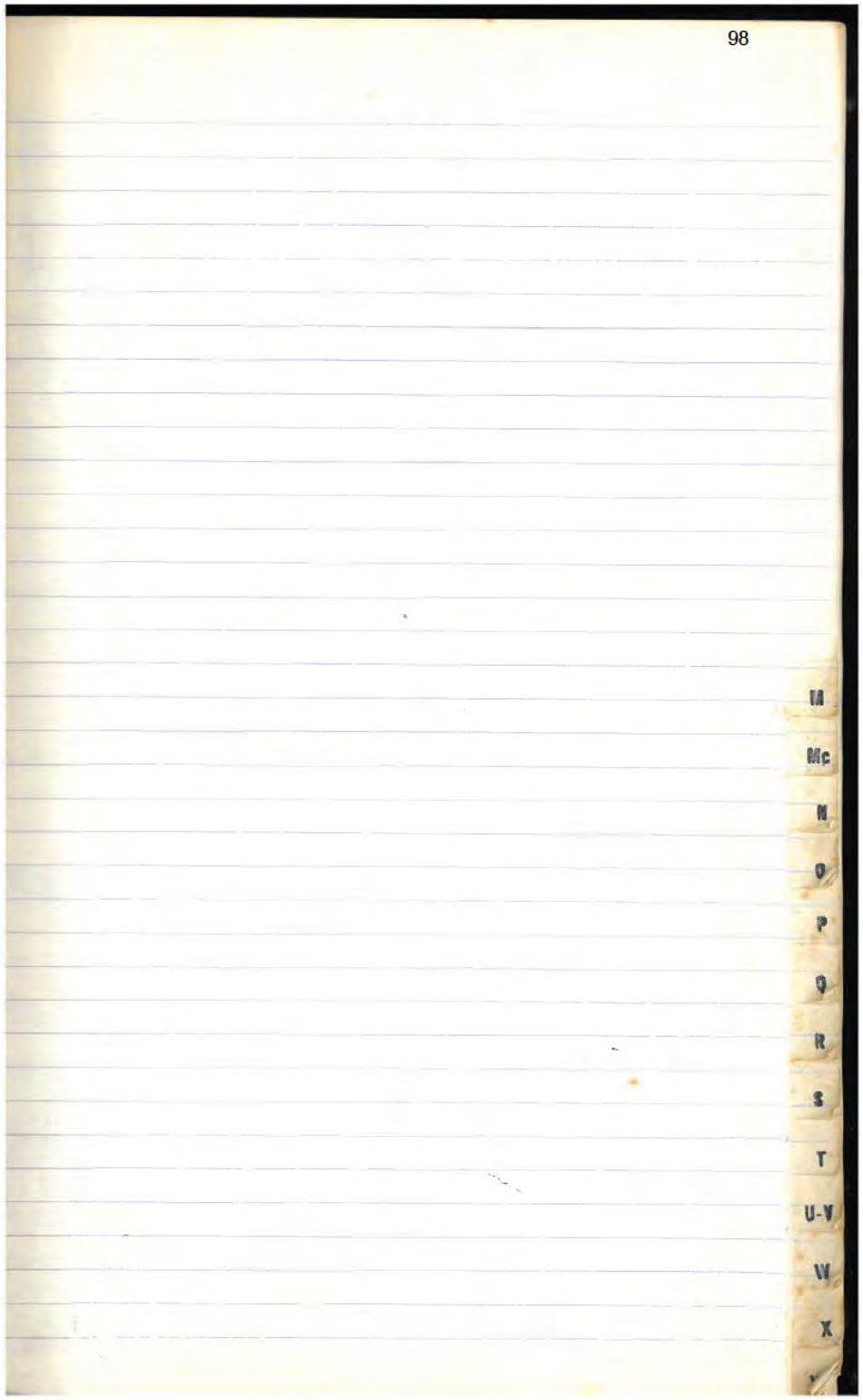

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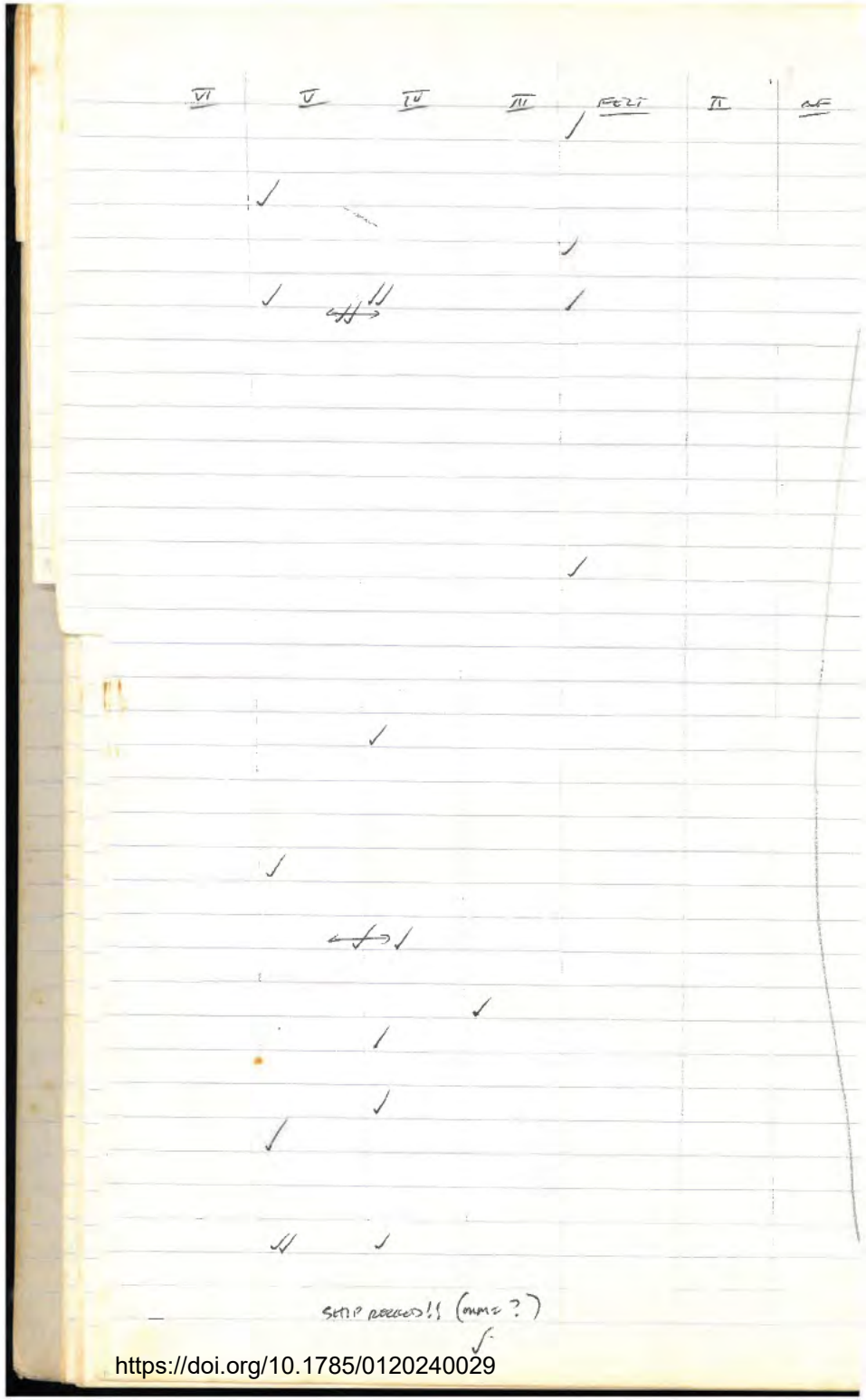

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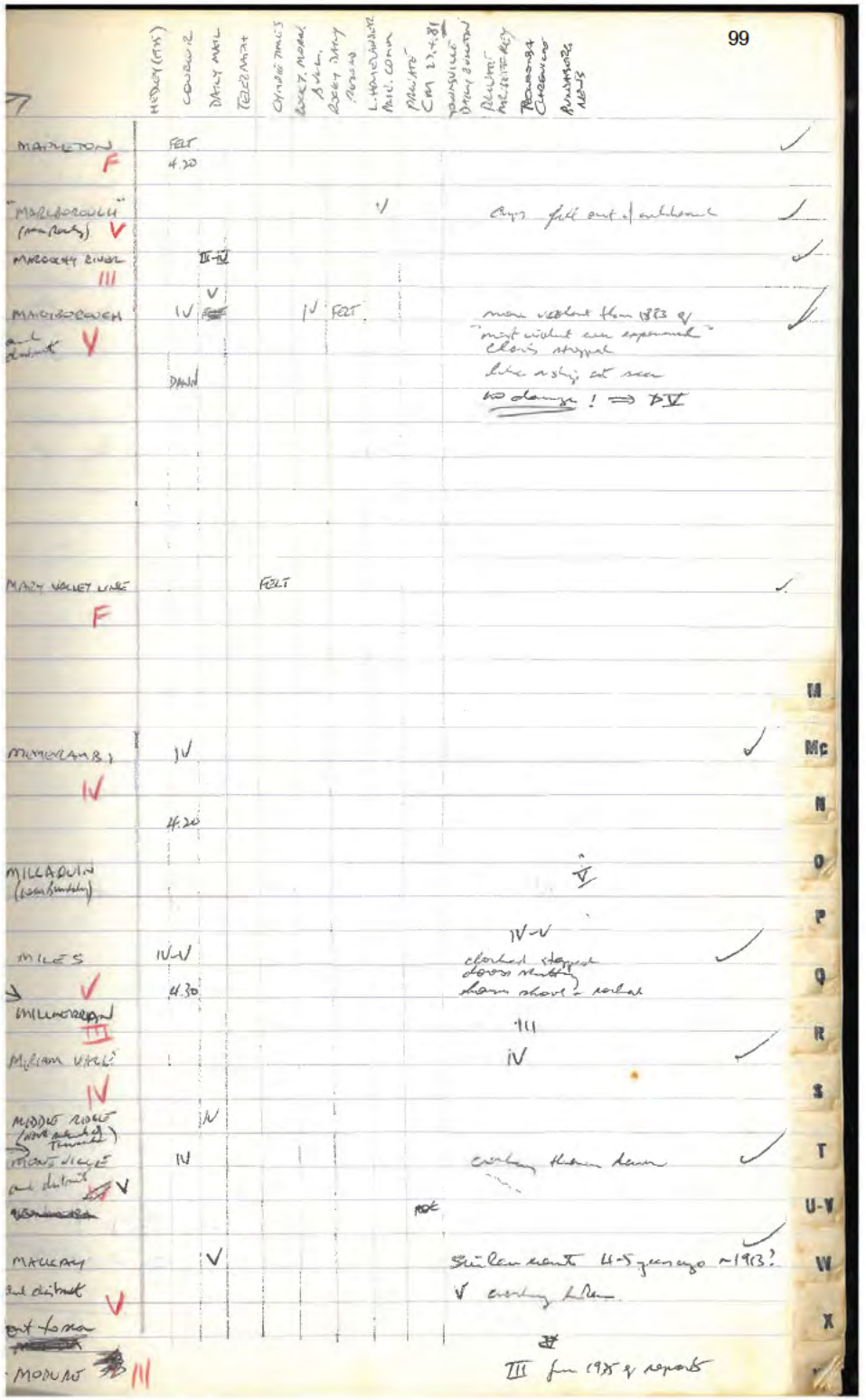

HEDLEY (1935) | COURIER | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN BULL. | ROCKY DAILY RECORD | Record reports. | Daily Standard | TOOWOOMBA CHRONICLE

MOOLOO F — FELT ✓

MOOLOOLAH F — FELT 4.30 ✓

MOONMORA IV — IV — People alarmed

MT. CANNINDAH IV-V — IV-V
4.30
4.45
4 tremors 4.15 and 6 am
8 pm
8.48 – 4/4.30 am

MT. MORGAN IV-V — FELT (III?) V IV/IV-V IV IV ... N great anxiety from miners working underground
4.30

MULDA V — V

Summary of … per … NES

HEDLEY (1935) | COURIER | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN. BULL. | ROCKY DAILY RECORD | TOWNSVILLE DAILY BULLETIN

MURGON and District V — V 4.15 — glassware thrown from dressers, doors thrown open ✓

MURRAY'S CK (… dist…) IV-V — IV-V — water in 1000 gal tank agitated, … of cream … doing … ✓

MURWILLUMBAH IV — IV FELT, IV, IV
4.15, 4.15, 4.15
4 4 M/s, 4 4 M/s, 4 4 M/s ✓✓

… entries … PAGE

Mc N O P Q R S T U-V W X Y

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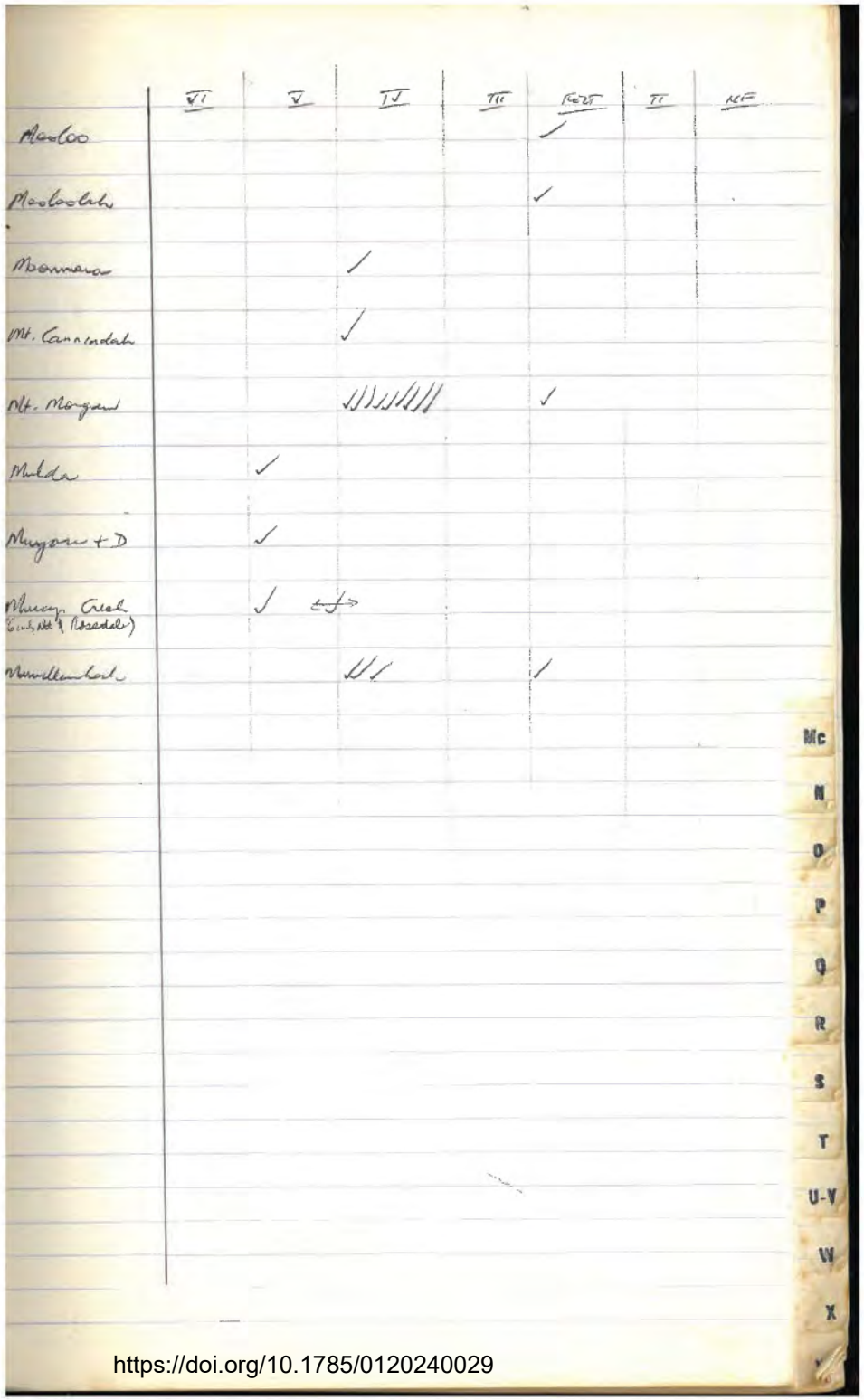

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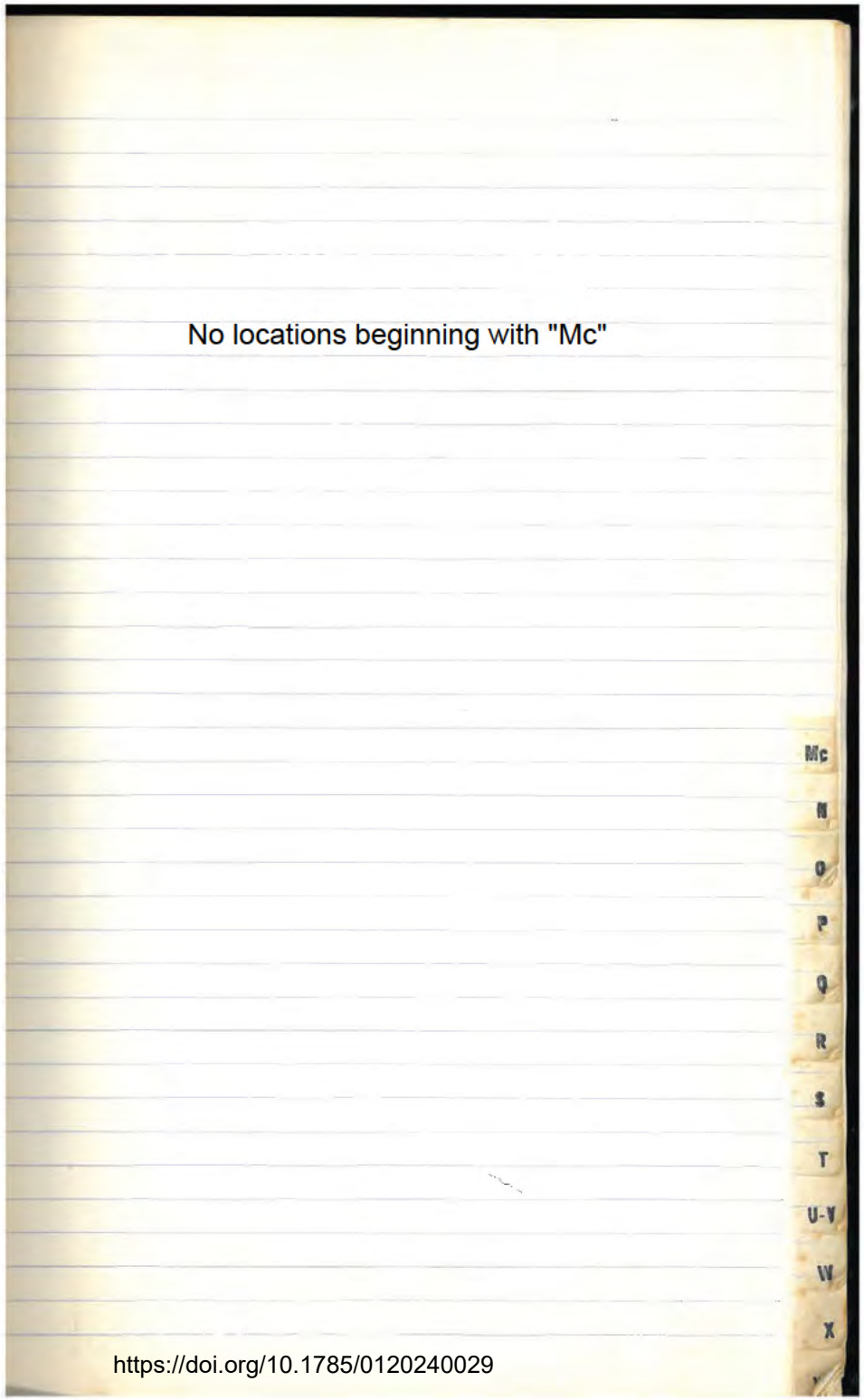

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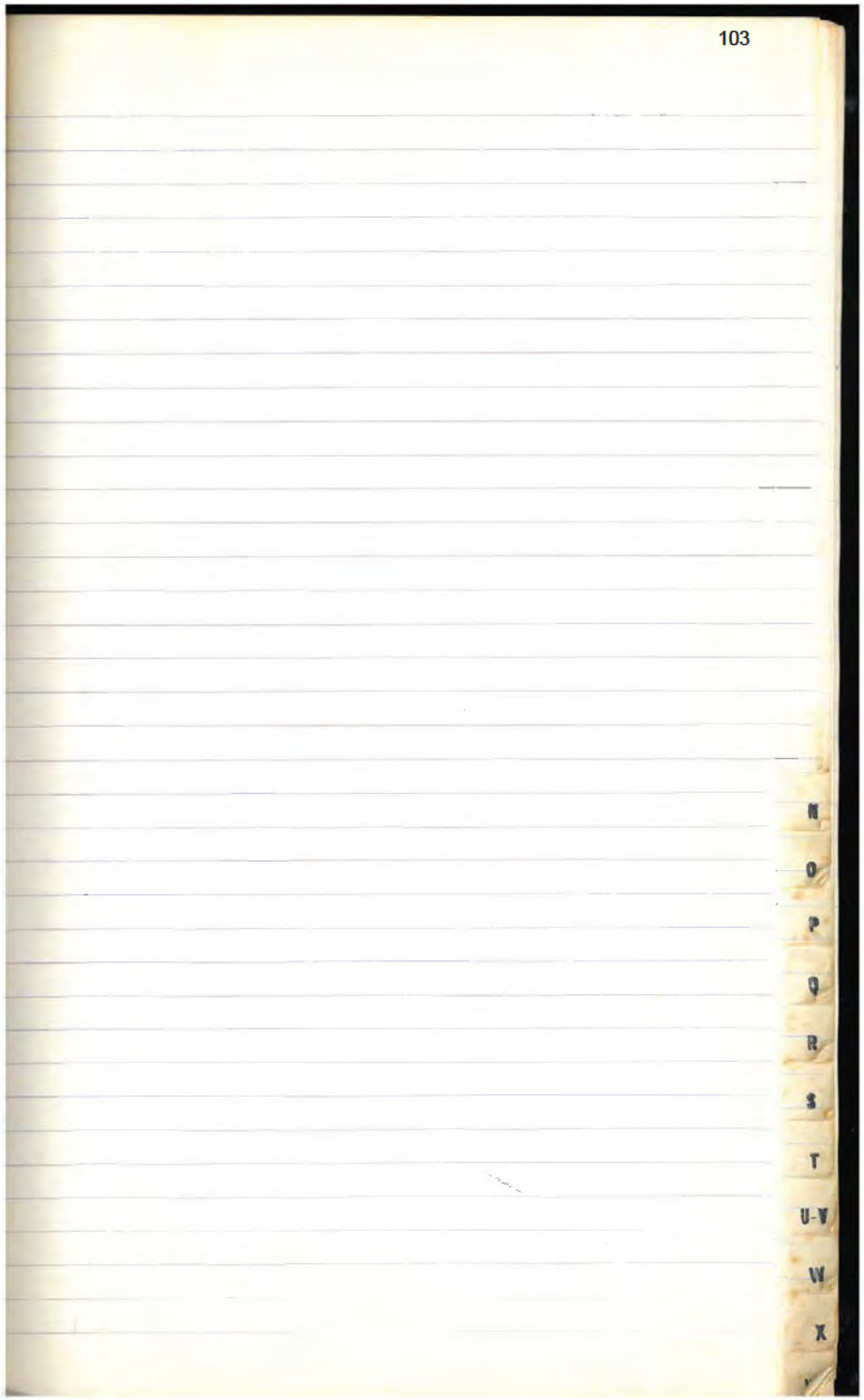


https://doi.org/10.1785/0120240029

	VI	V	IV	III	FELT	II	I

	HENLEY (1895)	COURIER	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	ROCKY. MORN BULL	ROCKY DAILY RECORD	DAILY STANDARD	TOOWOOMBA CHRONICLE		
NAMBOUR and District III		FELT III						III			✓
		4.20 4.15									
NANANGO and District IV		IV FELT								[illegible]	✓
NANYA (entertainment recovery) IV						IV 4.X					✓
NOBBY III									III		
NORTH BRANCH IV									IV		
NINE MILE (numbering)										[illegible] branch [illegible]	

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029

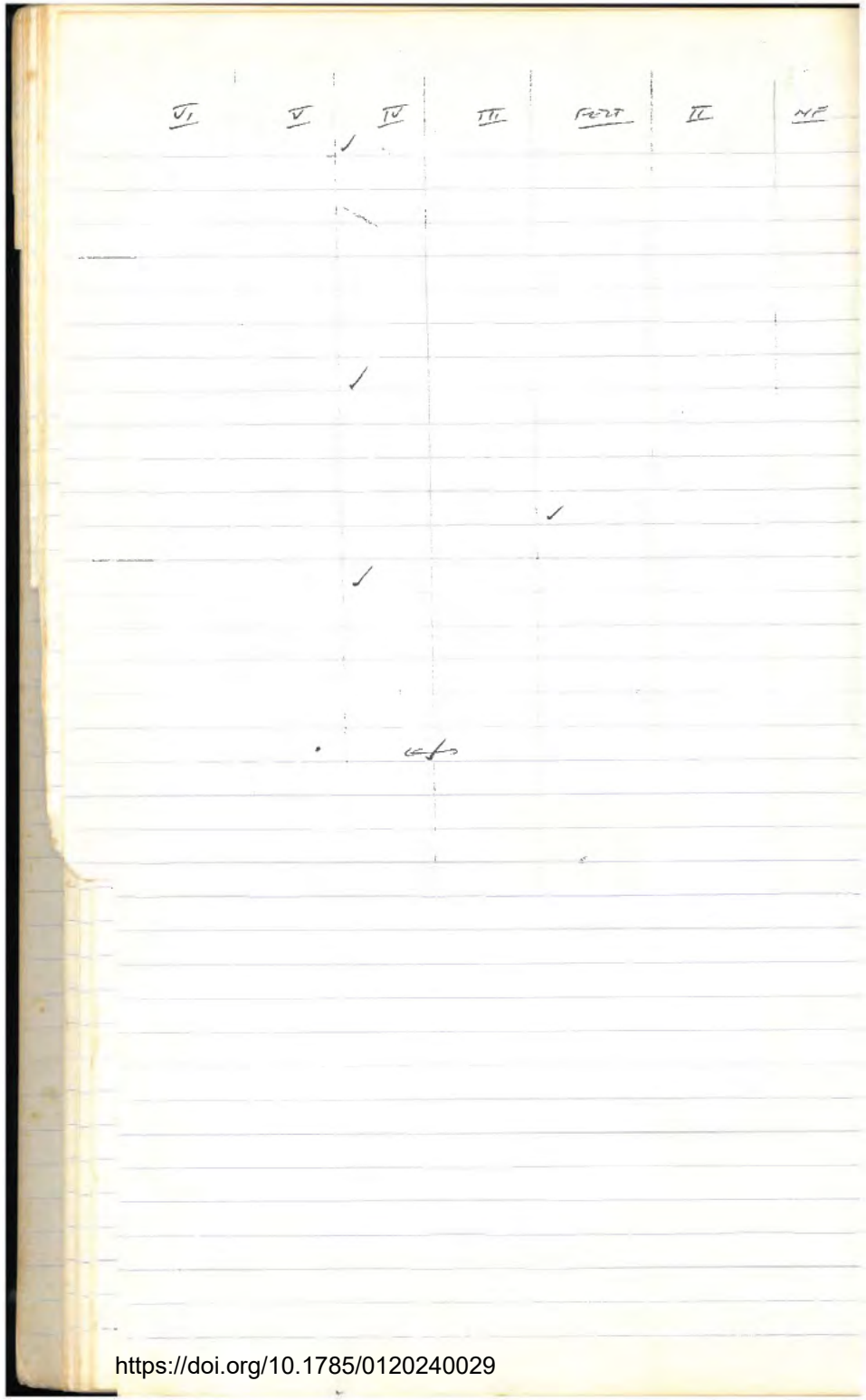
VI	V	IV	III	FIRST	II	No
			✓	✓		

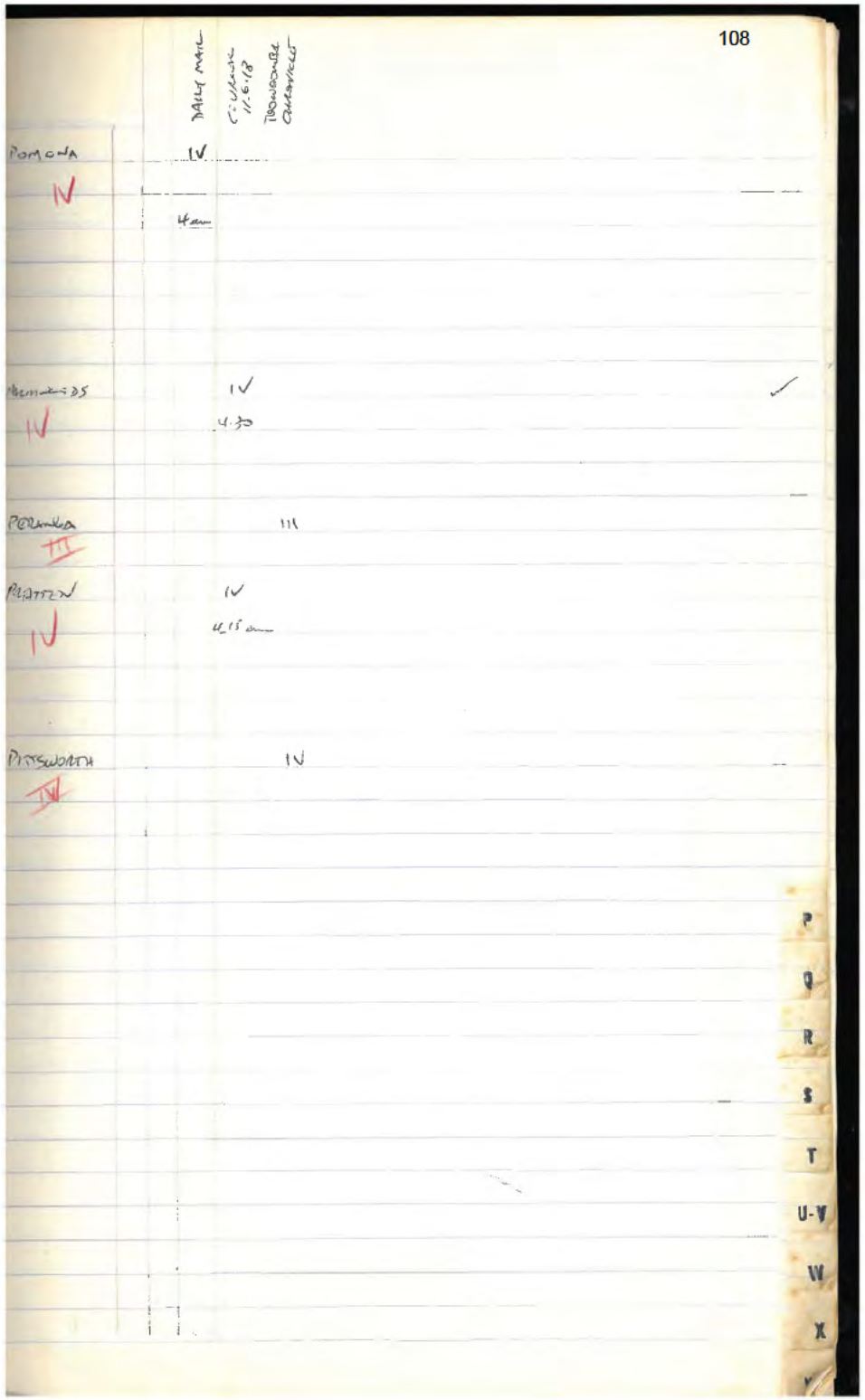
		TEEWARDS CHRONICLE	DAILY MAIL
DARCY		III	III
III			

O
P
Q
R
S
T
U-V
W
X

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029





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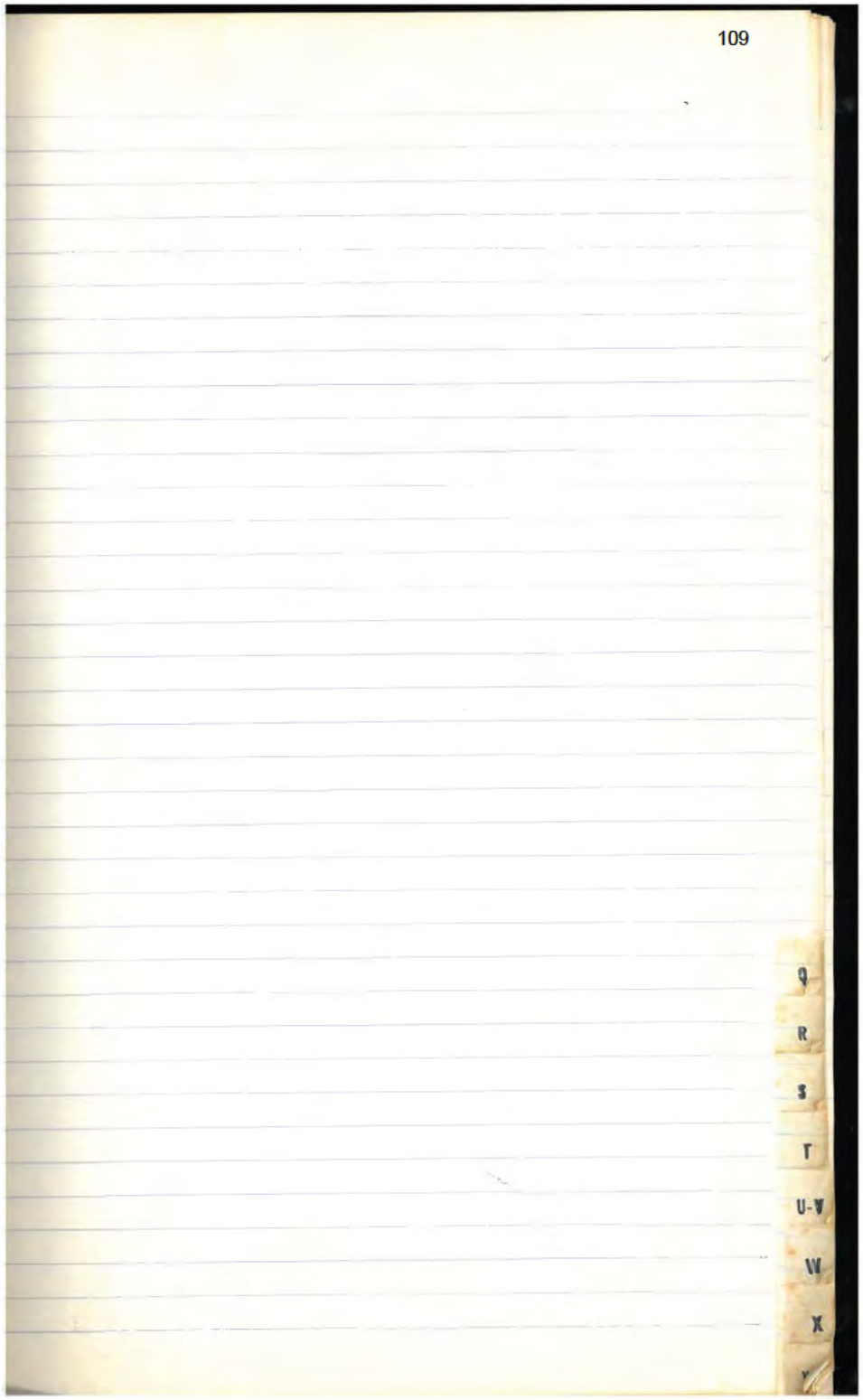


https://doi.org/10.1785/0120240029

VI V IV III · FERT II NF

✓

✓

TOOWOOMBA CHRONICLE

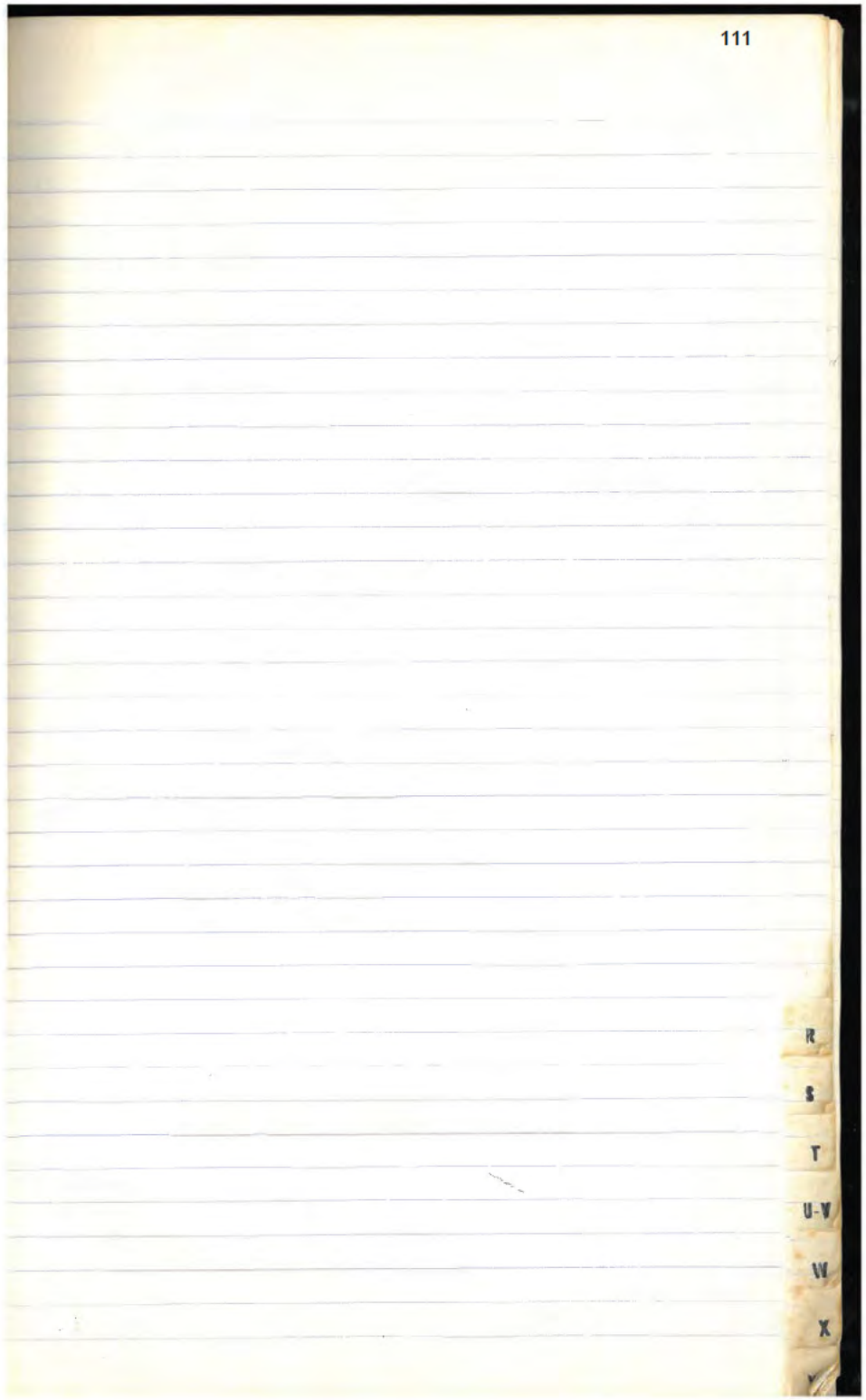
QUINLAN TII

TII

CURTIS BORAH (near Bowen) TV female comm.

Dig.f. cy.
SSM
12/4/2023

https://doi.org/10.1785/0120240029



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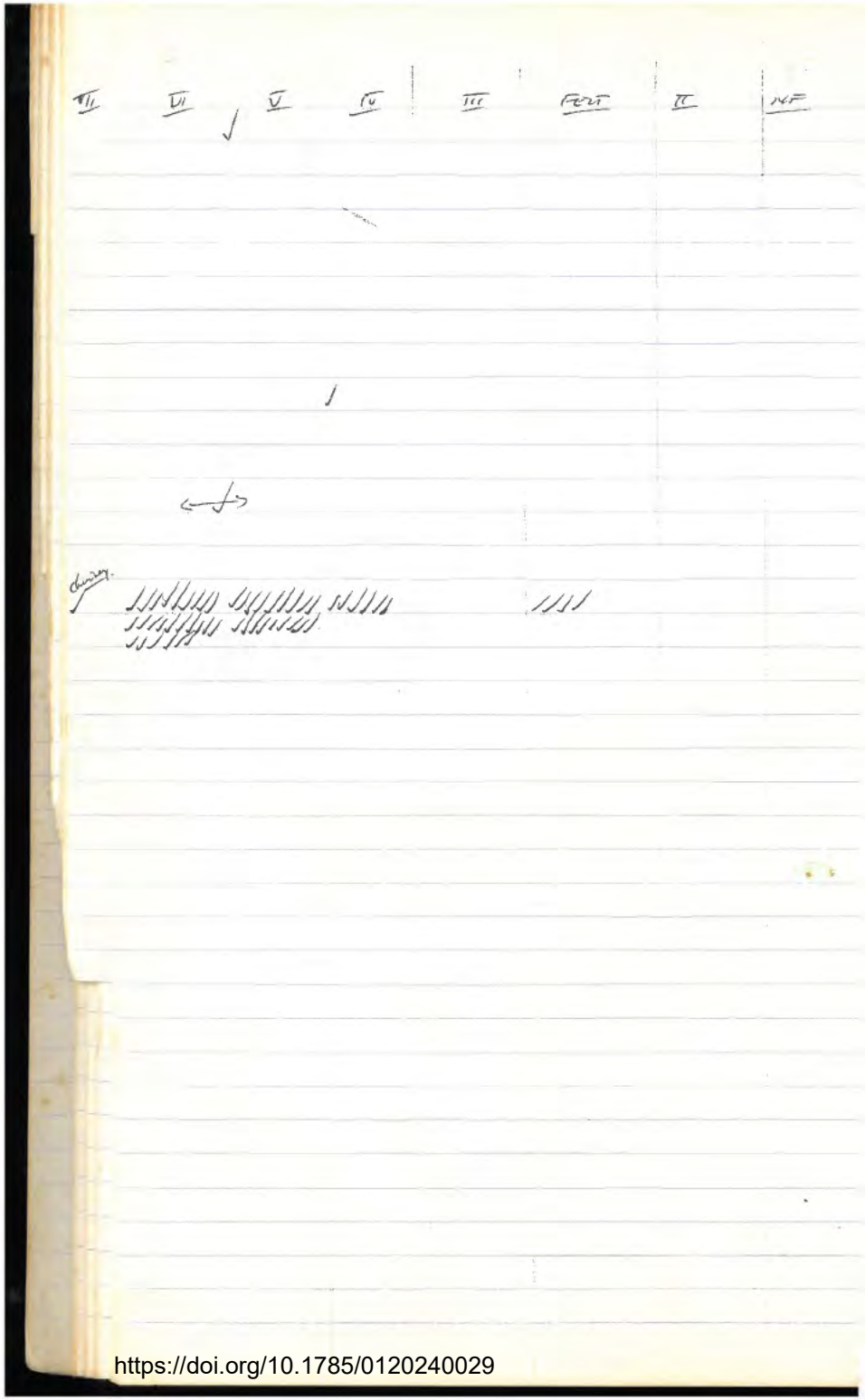

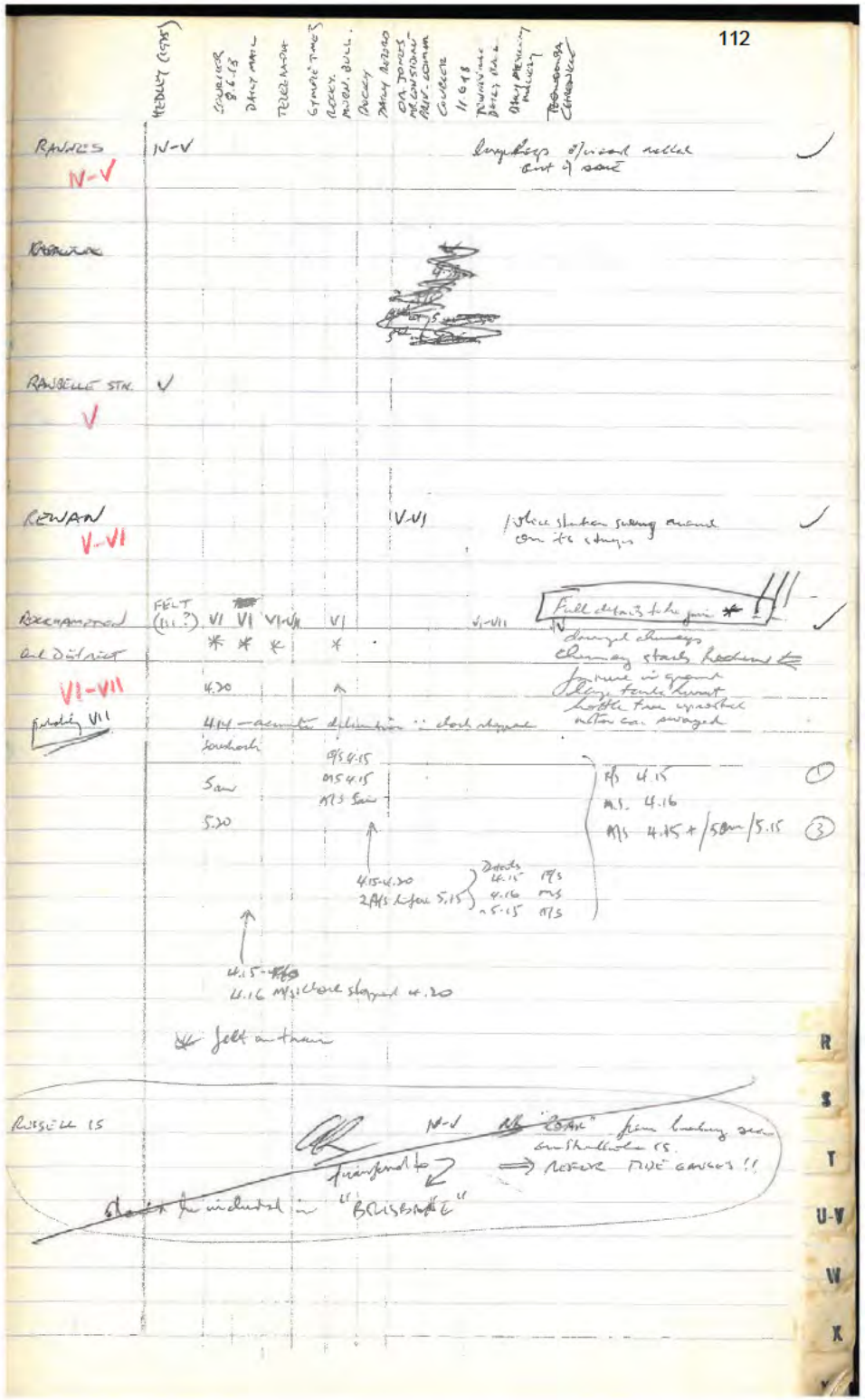

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	HEDLEY (FAX)	COURIER	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	ROCKY. MORN. BULL	ROCKY DAILY RECORD	WESTERN STAR	TOOWOOMBA CHRONICLE	
ROMA	FELT	FELT		FELT	FELT ~~[illegible]~~	FELT		IV	IV	√
and District										
IV		about and night						4.X	[illegible]	
ROSEWOOD		FELT								[illegible]
and district										[illegible]
F		4.10								

VI	V	IV	III	FELT	II	NF
		// [illegible]		//√		
		√				

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029

VI	V	IV	III	FELT	II	NF
				✓		
				✓//		
		✓				

	Hedley (1945)	Courier	Daily Mail	Telegraph	Gympie Times	Rocky Morning Bull	Rocky Daily Record	Western Star	Private Comm.
Sandy Cape F	-	~~[illegible]~~ FELT	FELT						
St. Lawrence F	FELT	FELT	FELT	FELT	FELT	FELT			
Stanthorpe IV									IV
Surat IV								IV	

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029

VI V IV III FELT II NF

//

✓

✓ [illegible]

[illegible] ✓ //

✓

[illegible]

✓

✓

HEDLEY (1915) | COURIER | DAILY MAIL | TELEGRAPH | GYMPIE TIMES | ROCKY. MORN. BULL. | ROCKY DAILY RECORD | [illegible] (BOWEN) | DAILY STANDARD | TOOWOOMBA CHRONICLE

TAMBOURINE MT — FELT FELT FELT FELT
F

TARA IV
IV

TAROOM V IV 'The ghost [illegible] the [illegible] of all the [illegible] in this town' — Gympie Times 8.6.38 ✓
V
4.20
Felt at 1.20
4.45
5.20 - shaky

TEWANTIN FELT Some IV V IV People alarmed ✓
V
4am

TEXAS — FELT FELT
F

THE RANGE (Rockhampton) IV-V IV-V

THEEBINE IV IV [illegible] from 1935 [illegible]

TINGOORA V bottles overturned ✓
V lamps [illegible] moved

T

U-V

W

X

Y

https://doi.org/10.1785/0120240029

	Hedley (1935)	Courier	Daily Mail	Telegraph	Gympie Times	Rockhampton Bulletin	Rockhampton Daily Record	Warwick Examiner
Toogoolawah F	-	FELT	FELT	—	—		—	
Toolburra								IV
Toowoomba V-VI	— see separate page →							
Tweed Heads N			IV 4.30 + A/s					

✓

	Hedley (1935)	Courier 3.6.18	Daily Mail	Telegraph	Gympie Times	Rockhampton Bulletin	Rockhampton Daily Record	Warwick Star	James (1918)	Courier 11.6.18	Townsville Evening Star	Toowoomba Chronicle
Toowoomba and District (V-VI)	IV *	VI *	VI	V		IV	FELT	V-VI		V/IV *	IV	V-VI

{Further details to be given + see Toowoomba Chronicle ✓

* Felt on train just west of Toowoomba
Furniture moved in house (Whaler, 1978)

4.16 – clock stopped

↑ 4.30

Summary of felt intensities
see Next PAGE

U-V
W
X
Y

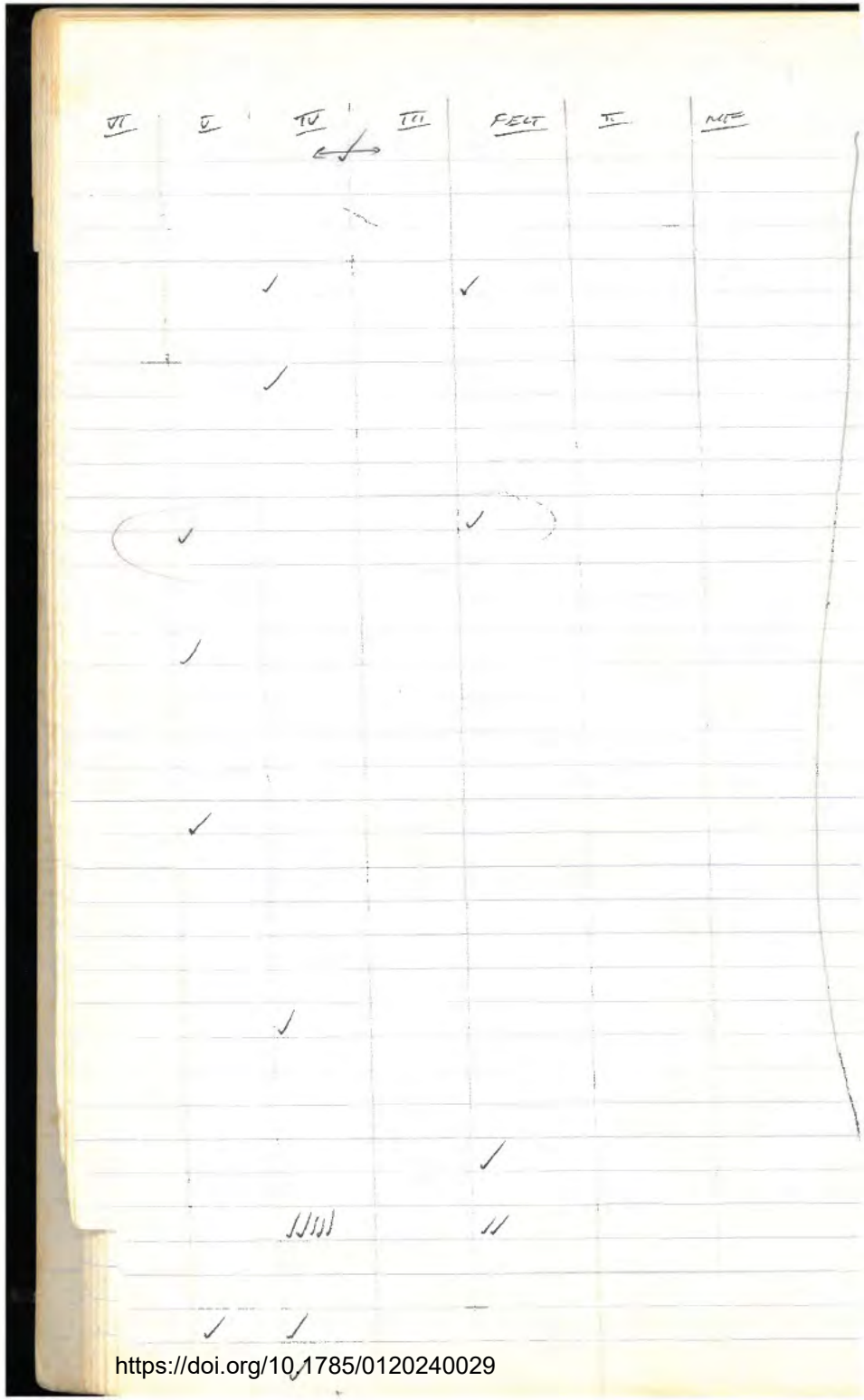
https://doi.org/10.1785/0120240029

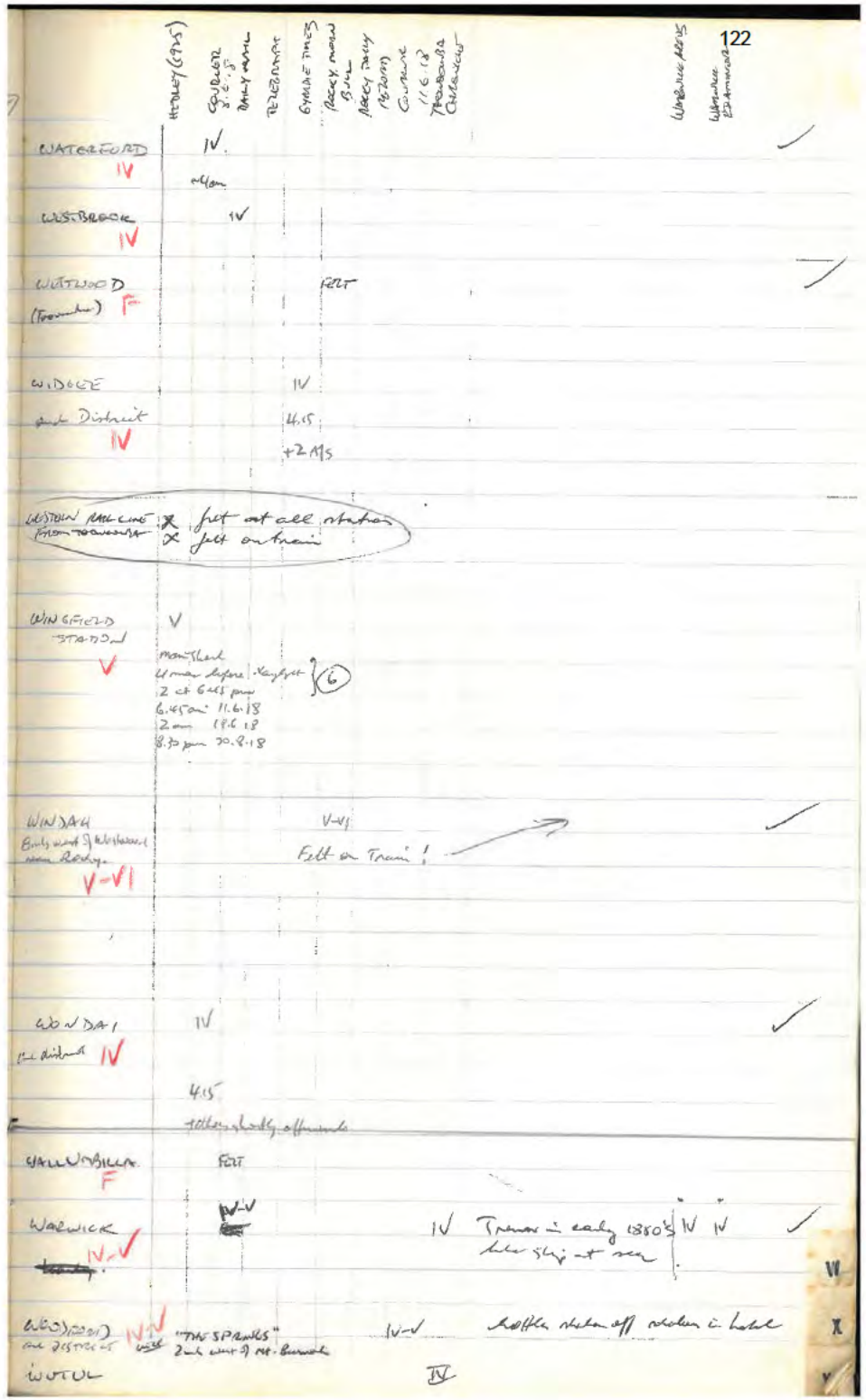
https://doi.org/10.1785/0120240029

No locations beginning with "U" or "V"

https://doi.org/10.1785/0120240029

https://doi.org/10.1785/0120240029





https://doi.org/10.1785/0120240029

No locations beginning with "X"

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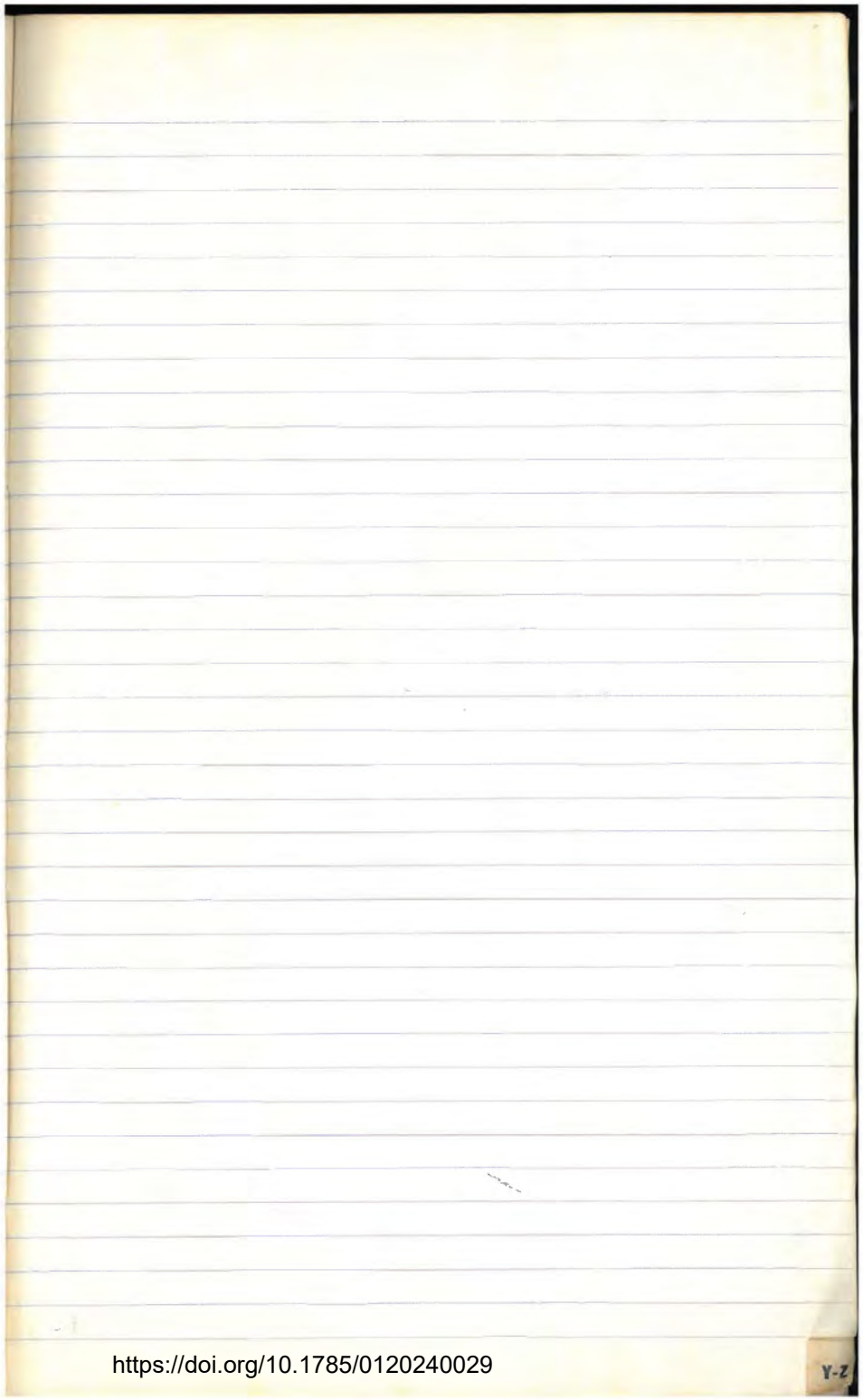

https://doi.org/10.1785/0120240029

VI	V	IV	III	FELT	II	NF
		//		✓/		
		✓				
	/	✓///		//		
				/		

	HEDLEY (1935)	COURIER	DAILY MAIL	TELEGRAPH	GYMPIE TIMES	ROCKHAMPTON ...	MACKAY DAILY MERCURY	MARYBOROUGH DAILY CHRONICLE	DAILY STANDARD	TOOWOOMBA CHRONICLE		
YANDINA IV		~~FELT~~ IV 4.15	IV						IV		people ran into street felt knocked to ground	✓
YARRAMAN CK IV		IV 4.10										✓
YEPPOON V	(VI ?) FELT			IV-V		IV 4.20 +2 A/S		FELT		IV		✓
YEULBA F			FELT									

No locations beginning with "Z"

https://doi.org/10.1785/0120240029

Supplementary Material 6 – Jack Rynn's epicentre calculations

This section presents pages from Jack Rynn papers relating to the epicentral location for the 1918 earthquake. It is evident from these pages that he relies on both the RIV S-P time as well as all previous epicentral estimates. He also appears to be guided by the azimuth determined by Gutenberg & Richter as well as the 1978 earthquake.

https://doi.org/10.1785/0120240029

Instrumental Calculations – for RIV

111.2) 1160 (10.4
1112
4800

10.50

	P	S
0	2.28.0	4.22.2
	6.9	12.3
	2.34.9	4.34.5

1.59.6

10.30

P	S
2.28.0	4.22.2
4.1	7.35
2.32.1	4.29.6

1.57

	P	S
33	2.24.4	4.16.6
	6.9	12.2
	2.31.3	4.28.8

SP 1.57.5

S−P = 1.57

for 0 km focal depth 10.3

for 33 km — 10.5

1160.

235, 151.5

for to

P curve

10.4° 0 2.28.0
5.48
2.26.65

1.35

33 2.24.4
5.48
2.24.9.5

1.35

2.26.7

2m 27s

3.6

P(MV) 18:16:53
t_p 2.27
to 18:14:26

azimuth ← GMR, RIV (calibration), 1978 Cap. analysis

https://doi.org/10.1785/0120240029

1918 Σ

Λόγος

RIV	18:16:53
Sydney	18:18:24
ADE	18:21:00
Batavia	18:23:00
Helevan	18:30:00
Tantosa	18:35:00

https://doi.org/10.1785/0120240029

University of Queensland
ST. LUCIA, BRISBANE, AUSTRALIA, 4067

1918 Eq

A7-△

33.83 151.16

RIV : 33°49.8'S, 151°09.5'E

~~Epicentre~~ RIV: 24°S, 154°E
~~Riverview~~ Grl 24°S, 152°E
ISS 23.3°S, 150.6°E
some felt 25, 152

RIV readings: S-P = 2m06s → 11° (0) 1222 km
JB tables 10.5° (B) 1167
10.7 Gutenberg 1190 km

Epi. from f. reports 23°S, 154°E
to give 1190 km 22.5 154

1978 Eq. 23.34 152.65
23.36 152.43

Gayndah Eq. BaW (1938) 25.5°S 151.67°E
Jones (1919) 26°S 151.1°E

https://doi.org/10.1785/0120240029

t_0 — problems with date 6 June / 8 June / [illegible] paper.

$p^o \simeq 111.19$ km

Epicentre of 1918 earthquake

Hedley (1925) : from Fr. Pigot $\Delta = 1180$ km [illegible]
610 mls.

1180 km $\simeq$ 733 miles
981 km $\simeq$ 610 mls

Letter to Bryan from Cotter, $P = 04:16:53$, $S = 04:18:38$; from letter 1140 km (708 mls); from [illegible] $S-P$: 1:45 $\rightarrow \Delta_{JB} = \begin{cases} 9.2° \ (0\text{km}) \\ 9.4° \ (33\text{km}) \end{cases} = \begin{cases} 1023 \ (0\text{km}) \\ 1045 \ (33\text{km}) \end{cases}$

Hedley (1925) correction : 24°S, 154°E ; NE of Hervey Bay ; 980 km NNE of Sydney.

~~Bryan (1936) letter from [illegible].~~
letter to Bryan from Fr. O'Leary 990 km
after recalculation of S wave arrival

Bryan (1936) letter from Fr O'Leary 990 km
~~([illegible])~~

$\Rightarrow$ epicentre varied from 980–1180 km.

km	mls
980	(610)
990	
1012	
1034	
1140	~~(733)~~ (708)
1180	(733)

200 km (124 mls)

135/68 k.

https://doi.org/10.1785/0120240029

Bryan — Rocky quote, extent than Bundaberg (Expert to Hedley) [illegible]

```
.LOG 125,105
Job 39 Prentice KL 701 #7 TTY66 Node 11 Line 46
Password:
%LGNCPW Password unchanged since 30-Jul-80
A/c balance is $2022.31
[Updated 18:52:27 19-Nov-81]
Cost limit : 5.
Charge no. 438, box no. 60
Cost limit $5.00
Seq. no. 241160
16:06:13 20-Nov-81 Fri

.RUN LOCDAZ


ARE YOU INPUTING IN DECIMAL DEG (1), OR DEG,M,S (2)?1



DO YOU WANT:
 CHANGE BOTH EVENT AND STATION COORDS (1),
 KEEP EVENT FIXED (2),
 KEEP STATION FIXED (3),
 FINISH (4).
3
TO GET BACK TO THE ABOVE SELECTION,
INPUT ALL ZEROES FOR COORDINATES.


EVENT LATITUDE,LONGITUDE:     -24.0,154.0
STATION LATITUDE, LONGITUDE: -33.83,151.16
DISTANCE = 1124.00730   EVE-STN =  193.59281  STN-EVE =    14.97127

EVENT LATITUDE,LONGITUDE:     -24.0,152.0
DISTANCE = 1092.58060   EVE-STN =  184.10122  STN-EVE =     4.50888

EVENT LATITUDE,LONGITUDE:     -23.3,150.6
DISTANCE = 1168.32650   EVE-STN =  177.44258  STN-EVE =   357.17368

EVENT LATITUDE,LONGITUDE:     -25.0,152.0
DISTANCE =  982.13000   EVE-STN =  184.55904  STN-EVE =     4.97282

EVENT LATITUDE,LONGITUDE:     -23.0,154.0
DISTANCE = 1231.92880   EVE-STN =  192.39545  STN-EVE =    13.75315

EVENT LATITUDE,LONGITUDE:     -22.5,154.0
DISTANCE = 1286.06280   EVE-STN =  191.87274  STN-EVE =    13.22004

EVENT LATITUDE,LONGITUDE:     -23.0,152.0
DISTANCE = 1203.07420   EVE-STN =  183.72792  STN-EVE =     4.12944

EVENT LATITUDE,LONGITUDE:     -23.34,152.65
DISTANCE = 1171.67090   EVE-STN =  186.79838  STN-EVE =     7.51432

EVENT LATITUDE,LONGITUDE:     -23.36,152.43
DISTANCE = 1166.99820   EVE-STN =  185.81405  STN-EVE =     6.42446

EVENT LATITUDE,LONGITUDE:     -25.5,151.67
DISTANCE =  924.68010   EVE-STN =  182.93688  STN-EVE =     3.18996
```

https://doi.org/10.1785/0120240029

```
DISTANCE =  887.99269   EVE-STN =  179.63223   STN-EVE =  359.60224

EVENT LATITUDE,LONGITUDE:     0000


DO YOU WANT:
 CHANGE BOTH EVENT AND STATION COORDS (1),
 KEEP EVENT FIXED (2),
 KEEP STATION FIXED (3),
 FINISH (4).
4

END OF EXECUTION
CPU TIME: 0.24  ELAPSED TIME: 5:15.68
Exit
```

https://doi.org/10.1785/0120240029

AZIMUTH – DISTANCE CALCULATIONS
FOR "OLD" EARTHQUAKE : 7.6.18

CUB 62

		°S LAT	°E LONG	Δ(RIV)		
RIV		33.83	151.16			
Epicentres						
RIV (Fr. Pigot) (Hedley 1935)		24	154	~~1124~~	10.1°	effects of a surface source
G+R		24	152	1093		
ISS		23.3	150.6	1168	(Town of Rockhampton)	
BMR DATA FILE		25	152	982		
Trials:	1	23	154	1231		
	2	22.5	154	1286		
	3	23	152	1203		
S?(RIV)	1978 Eq.	23.34	152.65	1172	(≡ 23.33/152.5)	
		23.36	152.43	1167		
S-P(RIV)	Gutenberg 1935 Bull (1938)	25.5	151.67	924		
✗	J (1938)	26	151.1	868		
	Hedley					
	Canberra					
	4	23.5	152.5	~1160		P 18:16:53
						S 18:18:50
		Cumul. of H.				S-P: 1m 57s
						Δ RIV 1160 km
						t_0

https://doi.org/10.1785/0120240029