rden, Girton C., Cambridge; N. B Cannar, outhampton Univ.; P. D Cattan, Manchester Univ.; A. R. Clarkson, University C., Lonon; K. B. Coonan, Liverpool Univ.; Miss S. Davies, King's C., London; D. B. Foskett, King's C., London; R. E. Glenister, Jesus C., Oxford; P. H. Goldsmith, Gonville & Caius C., Cambridge; Miss E. J. Hindley, Hull Univ.; P. D. King, King's C., London; E. J. Lawson, Trinity H., Cambridge; M. Lewis Jones, King's C., Loindon; A. McDonald, Liverpool Univ.; R. W. Seymour, Christ's C., Cambridge; M. G. T. Stokes, Leeds Univ.; N. A. Stone, Exeter Univ.; B. Suttill, Leeds Univ.; C. G. Toomer, Pembroke C., Cambridge.

Gerald Moody Junior Exhibition: J. Irvine, Lincoln C., Oxford; D. Turner, Queen's C., Cambridge; J. F. Uff, King's C., London; D. Worsley, Emmanuel C., Cambridge.

Air Vice-Marshal Roy Scoggins, C.B., O.B.E., who died on Monday at the age of 61, was Director of R.A.F. Dental Services from 1958 to 1964 and a former honorary Dental Surgeon to the Queen.

Mr. Dwight L. Stocker Jun., the American businessman and publisher of the Brussels Times, died in Brussels on Sunday at the age of 38.

R. Hunt and Co., Ltd., Earls Col and from 1951 to 1963 chairma of Ransome, Sims and Jefferie Ltd., Ipswich, died on Thursda at the age of 81. He was appointe a J.P. for Essex in 1929.

Mr. Walter Spencer Robertson Assistant Secretary of State for Fa Eastern Affairs in the Eisenhowe Administration, died in Richmond Virginia, on Sunday, at the age of 76.

Science Report

ASTRONOMY

Soviet observations questioned

Doubt has been cast on a series of Russian measurements which seemed to show that radio signals from certain cosmic sources are unusually variable. The Russian results were presented at a meeting of the Royal Astronomical Society a year ago, but it now looks as if in two cases at least the announcement might have been premature.

The point is that the Russian astronomers were recording wavelengths susceptible to interference caused by atmospheric influences. Two radioastronomers in Canada have pointed out that times when the Russian group say the signals were abnormally weak coincide with occasions when the effect of the atmosphere was particularly high.

Radio waves from space have to pass through the ionosphere—the layers of charged particles beginning about 80 kilometres above the ground which are responsible for radio communications over long distances—and signals at long wavelengths are particularly likely to be affected.

This is why radioastronomers have tended not to record the activity of cosmic sources at long wavelengths.

But astronomers are becoming increasingly aware that before a star or galaxy can be understood its emission needs to be measured at all wavelengths, and this has been the impetus behind the Russian work and similar activity in the United States and Canada.

Dr. A. H. Bridle and Dr. J. L. Caswell have been using a radio telescope at the Dominion Radio Astrophysical Observatory, British Columbia, which is similar to the Russian equipment and which ought to be affected by the ionosphere in the same way. Yet they find no evidence of variable radio signals other than variations that are due to the ionosphere.

The sources are the brightest radio star, known as Cassiopeia A, and an unusual galaxy. The doubt about their variability must mean that the variability of a third source studied by the Russians is in question.

What seems to have happened, according to the Canadians, is that the Russians have not been able to take full account of the effect of the atmosphere. Dr. Bridle and Dr. Caswell say that even at times when the ionosphere does not seem to be absorbing radio waves it can be affecting the strength of the signal in other waves. For example, just as a beam of light is deflected in water, the ionosphere can sometimes deflect long wavelength radio signals so that they miss the telescope.

Nevertheless astronomers are saying the Russian work is a very creditable effort considering the difficulties involved in observing long wavelengths signals from space. Much of what they have done with a special radio telescope near Kharkov still stands.

Apart from the Canadian team, the only other group which seems to have ventured into this difficult branch of astronomy in a large way is at Maryland University.

Source: Nature, January 24 (225, 356; 1970).

Dr.A.H.Bridle
Dr.J.L.Caswell
Dominion Radio Astrophysical
Observatory,P.O.Box 248,
Penticton,B.C.
Canada

B.P.Ryabov,I.N.Zhouck
Institute of Radiophysics &
Electronics of the Ukr.Acad.
of Science,Kharkov 85
U.S.S.R.

August I,I969

Dear Sirs,

Prof.Braude asked us to reply to your letter of July 9,I969.

Ionospheric scintillations at I2,6 MHz,as showed our measurements,have been rather essential,too.When measuring strong sources we have used a time constant which equals 30 sec,along with long constants.It is worth noting the variability 3C84 and 3C46I found by us is that of an average value of a flux density with a quasi-period about 3-4 months.The flux density value of these sources was determined by the averaging of 2 or 3 weeks records.The standard error of these measurements is 5-I0 %.Smooth and scintillative records were separately analysed;it showed that average value of both of them practically coincide(smooth records are slightly higher) but a standard error for scintillative records is thrice higher than for smooth ones.We should note that during I968-I969 flux density variations of 3C46I were significantly lower than in I966-I967.The variability nature of 3CI44 differs greatly from 3C46I and 3C84.It has been found that a typical quasi-period for 3CI44 is of the order of record duration or even less.

For refraction estimation there were made recordings of several sources in various declinations,as well as records by the virtue of one W-E array.It has been revealed that refraction

at I2,6 MHz is not essential for measurements with 90' diagram between half power points.

Yours

B.P.Ryabov

I.M.Zhouck

CANADA

Department of Energy, Mines and Resources
Ministère de l'Énergie, des Mines et des Ressources

Dominion Radio Astrophysical Observatory
Observatoire fédéral de radioastronomie
P.O. Box 248, Penticton, B.C.

File Number
N° à rappeler

9th July 1969

Prof. S.Ya.Braude,
Institute of Radiophysics and Electronics,
Ukraine Academy of Science,
Karkhov, U.S.S.R.

Dear Prof. Braude,

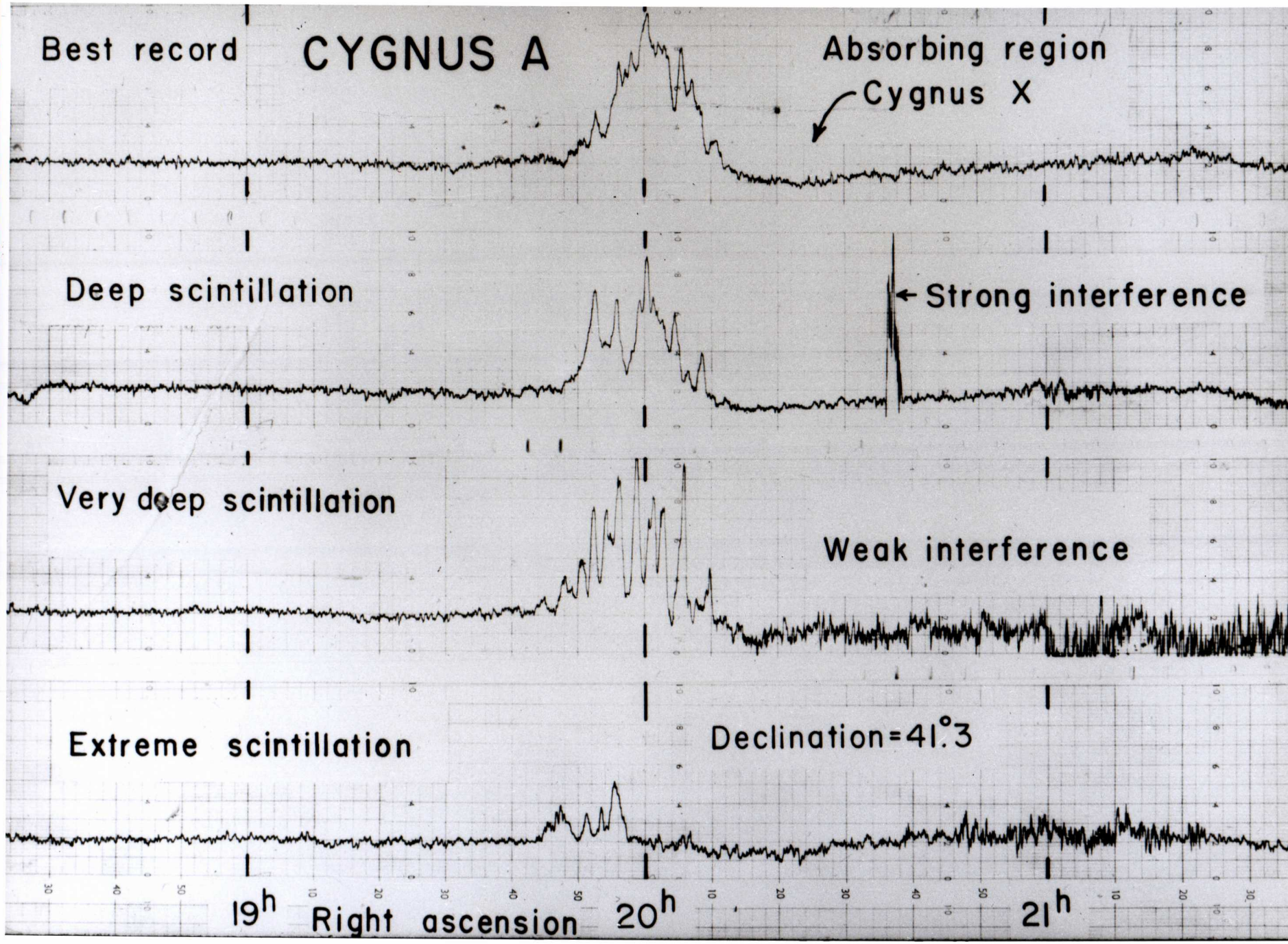
We have read your recent papers on variability of 3C 461, 3C 84 and 3C 144 with great interest, as we too have been observing at these low frequencies.

We are interested in your observing procedures at 12.6 MHz, for comparison with our own at 10.03 MHz. We have had problems with ionospheric scintillations and found it necessary to use time constants $\leq$ 60 sec to detect large fluctuations. We wonder if your group has also monitored scintillations regularly in this way, or if you use only the longer time-constants mentioned in your papers. Also, we have found refraction in the North-South plane troublesome, and wonder how you have measured this effect during your observations.

Yours,

Dr A.H.Bridle

Dr J.L.Caswell


Best record
CYGNUS A
Absorbing region
Cygnus X
Deep scintillation
Strong interference
Very deep scintillation
Weak interference
Extreme scintillation
Declination=41.°3
19h
Right ascension
20h
21h

ASTROPHYSICAL LETTERS

United States Editor:
Alan Maxwell
Harvard College Observatory
Cambridge, Massachusetts 02138
Tel: 617-868-7600, Ext. 2662

13 March 1970

Dr. A. H. Bridle
Astronomy Group
Department of Physics
Stirling Hall
Queen's University
Kingston, Ontario, Canada

Dear Dr. Bridle:

Thank you for the copy of your letter of March 5, concerning the paper by Braude et al.

I entirely agree with your comments.

Yours sincerely

Alan Maxwell

AM/ac

Alan Maxwell

cc: J. Léorat

Astronomy Group
Department of Physics
Stirling Hall

5th March 1970

Dr E.Schatzman,
Institut d'Astrophysique,
98bis, Boulevard Arago,
Paris 14e,
FRANCE.

Dear Dr Schatzman,

Your letter of 20th February was forwarded to me here by the U.S. National Radio Astronomy Observatory. Dr. Lequeux appears to be under the misapprehension that I work there, whereas in fact I am only an occasional visitor to their facilities. I am afraid this has introduced some delay in my receipt of the paper 'On variability of radio sources 3C 84 and 3C 461 in a decametric wavelength range' by Braude et al., which you asked me to referee.

I am not certain that I am the best person to referee this paper, as a paper by myself and Dr Caswell of the Dominion Radio Astrophysicall Observatory, referred to by Braude et al., is in conflict with their basic proposal. It might be preferable to elicit the opinions of a low-frequency astronomer who is not directly involved in this discussion, such as Dr. W.C.Erickson at the University of Maryland, or Dr.P.J.S.Williams at the University College of Wales in Aberystwyth, Wales.

I have, however, made comments on the paper, and enclose them on a separate sheet, so that you may use them if you desire.

Yours sincerely,

Dr A.H.Bridle

cc. Dr A.Maxwell

COMMENTS ON: Braude et al., 'On variability of radio sources 3C 84 and 3C 461 in a decametric wavelength range.'

The paper suggests that variability of the decametric radiation from 3C 84 and 3C 461 is intrinsic to the sources rather than an ionospheric effect. The authors have suggested this elsewhere (M. N., 143, 301 - 1969), and the suggestion has been criticised by Roger (Astrophys. Lett., 4, 139 - 1969), who points out the variations observed over a longer time period at 22 MHz are not significantly greater than those found for other sources, and by Bridle and Caswell (Nature, 225, 356 - 1970), who point out that the variations at 10 MHz are no greater than those to be expected from ionospheric phenomena and discuss how these affect the observations of Braude et al. These criticisms are not fully answered in this paper. In particular, Roger's comparative discussion is not mentioned, although the importance of such a discussion is stressed (p.4, ll.8, 14). Bridle and Caswell's criticism of earlier comparisons made by Braude et al. on the grounds that sources were observed at significantly differing local times is unanswered, although the comparisons are re-stated (p.4, l 6 to 10).

The substantive difference between this paper and that already published (M. N., ibid.) therefore lies in Figures 1 and 2, in which selected data on 3C 461 and 3C 84 from different observatories are combined, using a normalisation procedure which is not adequately described. (The meanings of the symbols on the vertical scales are not given, nor are they obvious). For Figure 1, the authors contend that the data obtained during 1968 are distributed significantly differently from these obtained during 1966 and 1967 (footnote, p.3). This is not visually obvious and should be supported by a proper statistical analysis. The conclusion that the claimed change in the distribution cannot be due to ionospheric effects (footnote, p.3) is unsound, as ionospheric conditions may be expected to show only a

loosely repetitive seasonal variation. The data of Figure 2 are more convincing, but a proper statistical analysis of their deviations from a random distribution is desirable because of their large individual errors. Further, a datum given by Roger for early 1967, and which does not confirm the visual impression of the trend shown in Figure 2, has been omitted with no reason given.

The paper is written in very poor English, and would need substantial editing to conform with accepted English usage. Examples of this are p.1, second sentence and p.3, ll.7, 8. References are made at an excessive rate - there are fifteen references to the same earlier paper by these authors, and eleven to the same paper by Bridle and Caswell.

I would not recommend publication in the present form.