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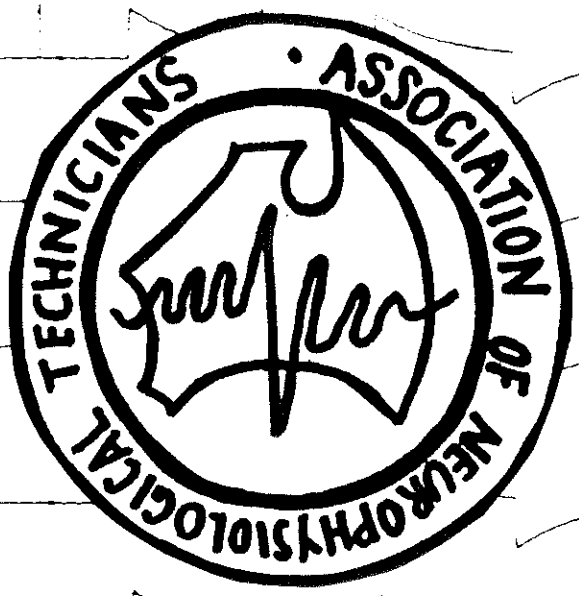

JOURNAL

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Labels by courtesy of Paul Burmeister, Vic.

A LETTER FROM THE EDITOR

It doesn't seem possible that it is a year since the last Xmas issue of ANTA. I'm not sure whether that means it has been a busy year, or simply that as one gets older, time does indeed fly. Whatever the reason, I as usual am not ready for the festive season.

I must say that in regard to my involvement with ANTA, I have had a very enjoyable year, and instead of my usual complaint about lack of contributions for the journal, I would like to thank ANTA members for their efforts this year in keeping the journal active.

If anybody has been wondering why a contributed article has not appeared, please bear with me. Unless it is an original contribution, I must obtain copyright permission and that takes considerable time.

I would like to thank Medical Applications, Surgicon and Oxford ETP for their continuing support with the journal throughout the year, and to wish everybody a very merry Xmas and a prosperous and safe New Year.

RAE WELFARE

ANTA President and Editor

REPORT ON O.S.E.T. CONFERNCE

This was an excellent conference held in an idyllic setting at Veldhoven in The Netherlands.

There was just over three hundred and fifty participants from eleven member countries plus a representative from the U.S.A., Taiwan and three from Japan. We had two representatives myself and Marie Zoethout, our Course Co-ordinator from R.M.I.T.

The ten representatives from Sweden were welcomed as new members of O.S.E.T.

New O.S.E.T. Executives are:-

President	Carol Van Velzer	Canada
Past President	George Klem	U.S.A.
Secretary	Els Newball	U.K.
Treasurer	Wilfred Wehrli	Switzerland
Member at Large	Iet Beckman	The Netherlands

The President expressed concern about the lack of communication between member countries and the Executive and has requested that she receives at least one letter a year from the countries representative, plus their Journals.

She has also requested that each country propose projects for O.S.E.T. to carry out during the next four years. The projects must be within the O.S.E.T goals and consideration must be given to the fact that O.S.E.T. functions mainly by mail. Proposals should include how the activity would be carried out, the anticipated benefits and whether the proposing society are willing to lead the project. Please give this some thought and let me know your ideas as I have to send her three proposals within the next two months.

The Newsletter is to continue with at least one publication a year and a submission is expected from each country. They are also looking for nominees for the Newsletter Commission. Any Offers?

News Editor is Ms Mary Boland, National Hospital, Queens Square, London

Mrs D. Battye, Chairman of the Education Commission presented the document on the Optimum Training Requirements for Student Technicians/Technologists in Clinical Neurophysiology, a copy of which I have sent to all States.

Sponsorship scheme to continue and to be known as Link.

O.S.E.T. fees are due January 1st, each year and are 1.50 Swiss frans per member.

Next IFSECN Congress to be held in Rio de Janiero, January 1990.

The venue for the next O.S.E.T. conference has yet to be decided, it will either be here in Australia or Israel as no European country was willing to hold it.

Vera Stevenson
OSET Representative

ACCREDITATION AND QUALITY ASSURANCE

This is an exercise that all hospitals in this country have either undertaken or will be required to do so in the near future. Maybe some one who has gone through this exercise would like to enlighten other members.

Accreditation is a word that crops up more and more these days. At the O.S.E.T Conference it was suggested that the Executive should be looking at gaining Accreditation of the various countries training programmes. A.N.T.A. is also talking of having accredited members. So ACCREDITATION is the in thing, so how about enlightening the uneducated on this topic.

Vera Stevenson
Whyalla Hospital. SA

THE NORMAL NEONATAL EEG

I have come to realize, through personal experience, that one cannot begin to accurately evaluate a neonatal EEG recording without first familiarizing oneself with several normal recordings. After gaining permission from the Director of the Premature Nursery and the parents, I performed 30 minute EEG's (with respiration, ECG and EOG monitors) on 20 healthy neonates between the age of 27 weeks and 40 weeks. The following is the result of my 4 month study. I emphasize that looking at one page of EEG is nowhere as satisfactory as having the whole EEG in front of you. That is why I recommend you actually do a few yourself. It is a difficult task doing an EEG on an infant in a humidicrib, but you'll be amazed at how much easier it is to do it on a normal infant - they are so much more peaceful.

GUIDELINES TO READING NORMAL NEONATAL RECORDINGS

1. Determine Conceptional age/Gestational age
   1st day of last menstrual period, without consideration of time of birth is day one. So, if a baby was born on its 27th week after conception, and you do the EEG 7 days later, it is 28 weeks old at the time of the EEG.
   G.A. = 28/40 - this is how it is written, 40 weeks is when the birth should have taken place.
   Maturity of the EEG depends on the G.A., regardless of the degree of prematurity, the EEG is not greatly influenced by the birth process. EEG maturation is also independent of weight.
2. Determine Infant's State (by observation)
   Sleep-wake EEG differentiation is difficult before 32 weeks and clear after 37 weeks. Observation and polygraph monitoring can accurately reveal the sleep state the infant is in.
3. Evaluate EEG Features in Context of Age and State

IMPORTANT TRENDS IN EEG ONTOGENESIS (DEVELOPMENT)

1. development of a continuous background
2. progressive differentiation of sleep states
3. reduction in number of normal spikes and sharp waves
4. development of occipital predominance
5. an increased reactivity to stimuli

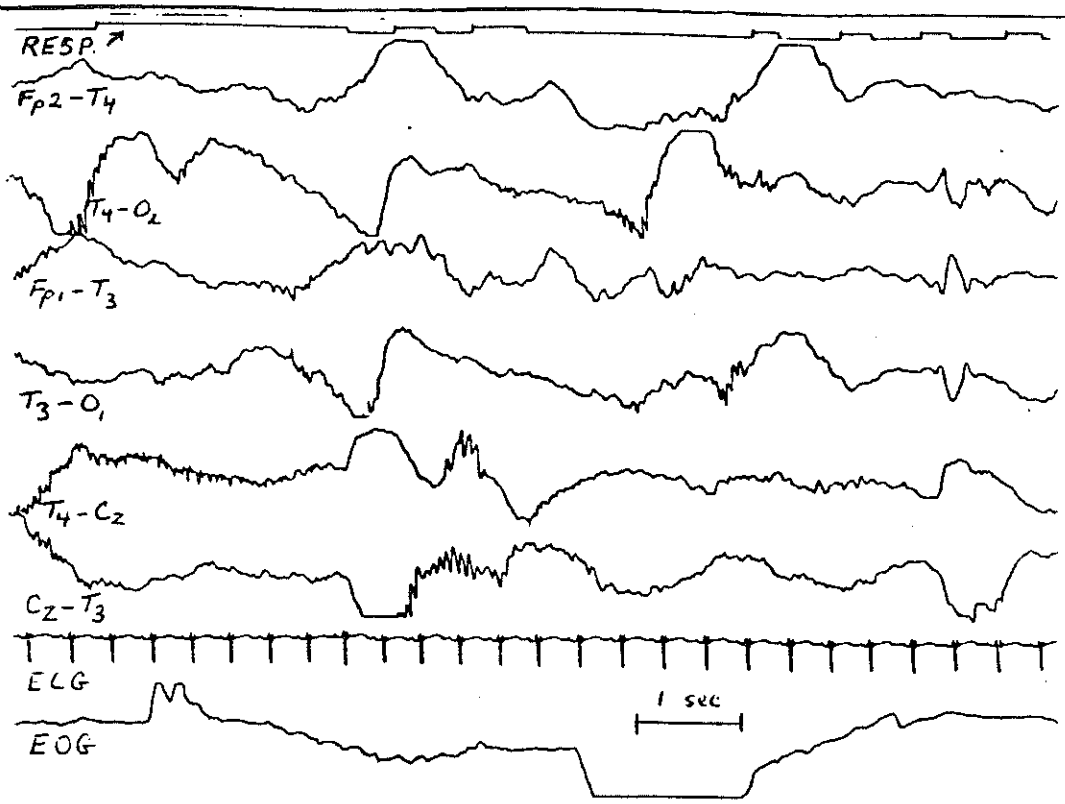
DETERMINATION OF SLEEP STATES

WAKEFULNESS - judged on basis of behavioural observations: eyes open, crying, body movements

ACTIVE SLEEP
- equivalent of REM sleep
- predominant sleep pattern of the premature, slowly decreasing so that it occupies 50% of sleep time at term (40 weeks)
- continuous or intermittent eye movements are present
- intermittent, migratory movements of limbs and face
- movements are seen on EMG monitor, otherwise EMG shows hypotonic
- heartrate is regular but may become irregular duringapneic episodes of the premature
- respiration is irregular

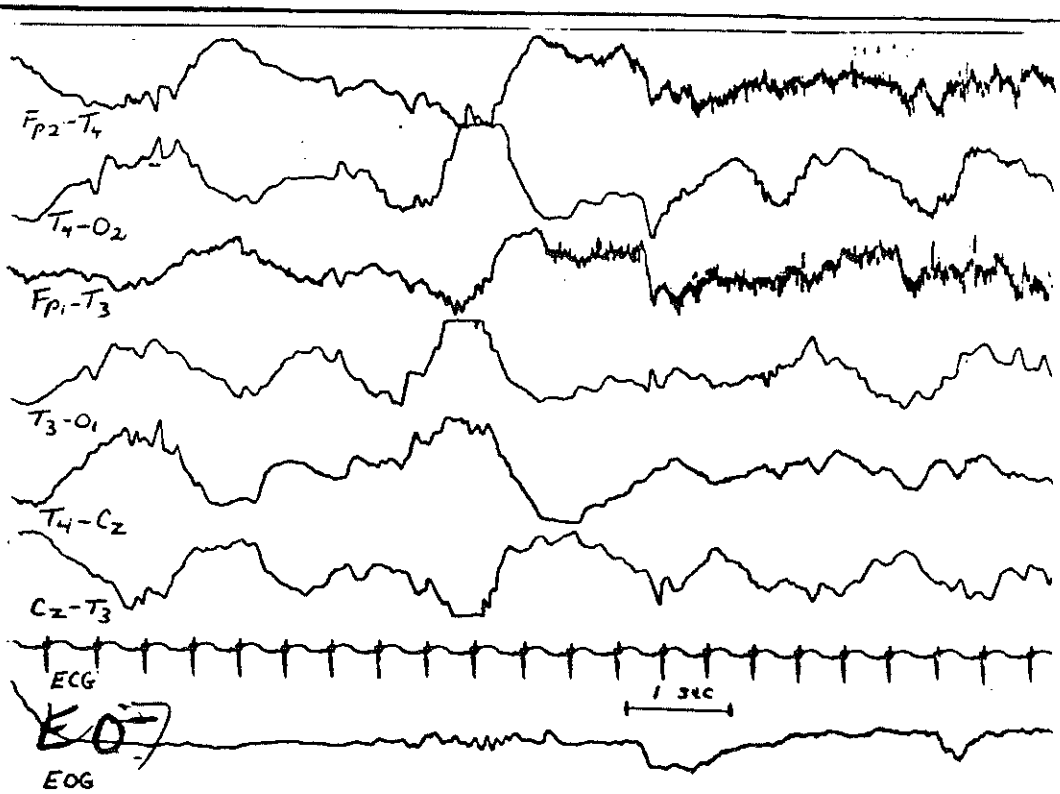
QUIET SLEEP
- occupies 20% of total sleep time at 30 weeks and 40% at term
- no eye movements are recorded
- no face or limb movements
  EMG is continous low-level activity
- heartrate is regular
- respiration is regular

INDETERMINATE SLEEP
- Do not fit criteria of active or quiet sleep
- often occurs when sleep begins, or when sleep states change, in early prematurity

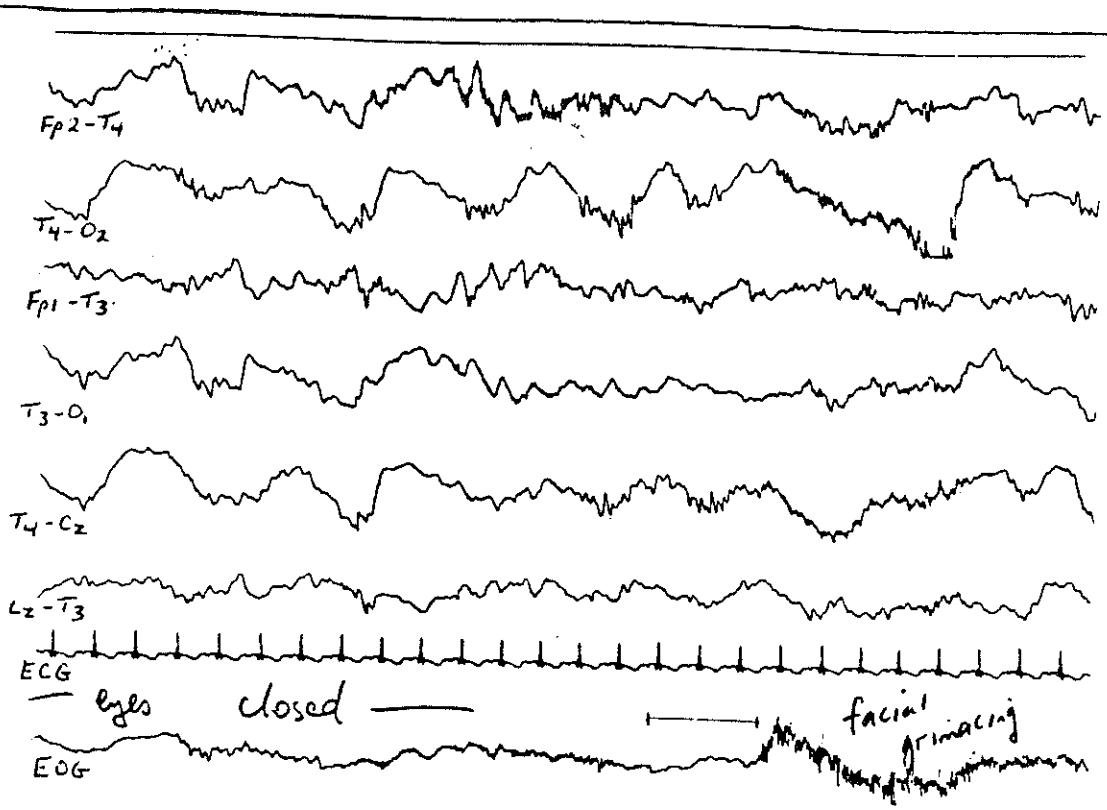


G.A. 30 weeks ACTIVE SLEEP

- 70 % of total sleep time
- active and wakefulness must be differentiated by behavioural observations because the EEG looks very similar

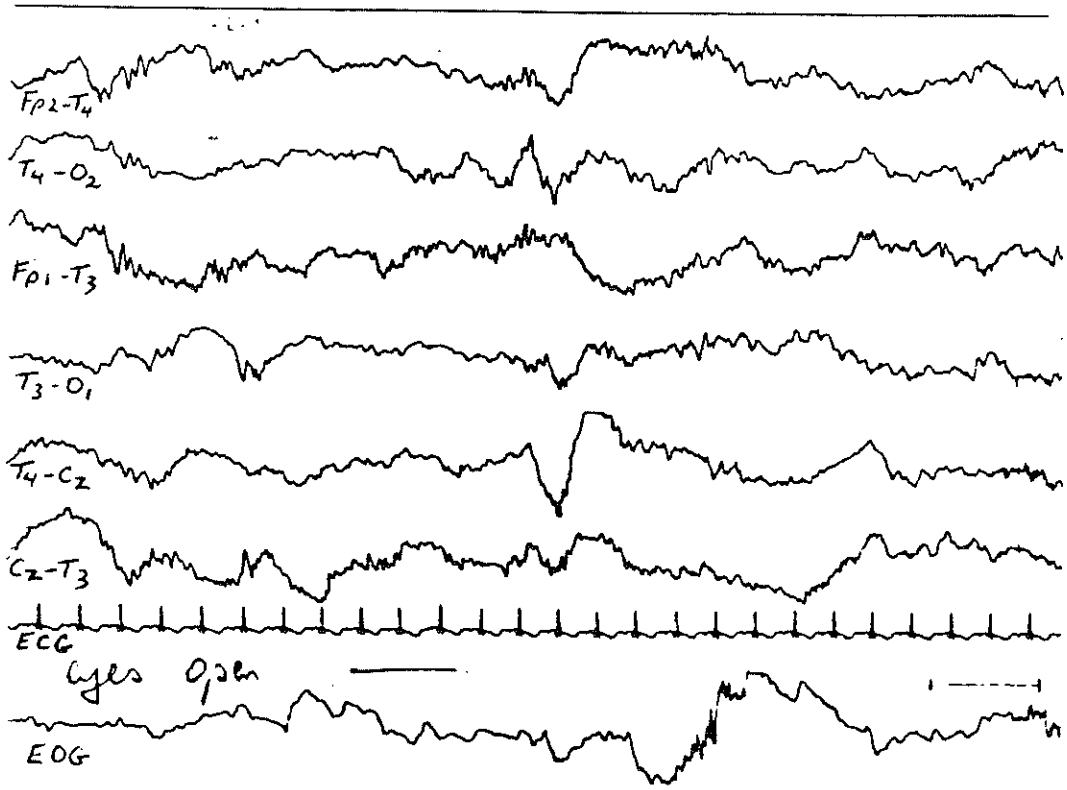


G.A. 30½ weeks AWAKE

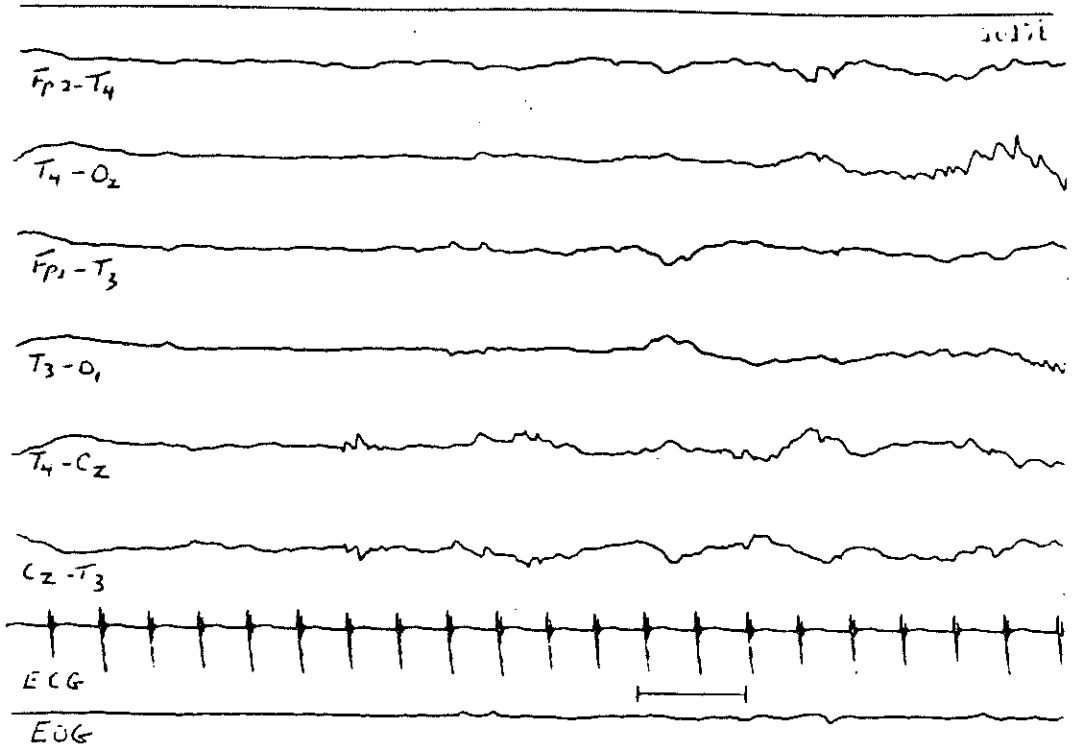


G.A. 34 weeks ACTIVE SLEEP

- the background is continuous and consists of low amplitude fast frequencies with bursts of slow waves intermixed; occipital predominant slow begins to develop

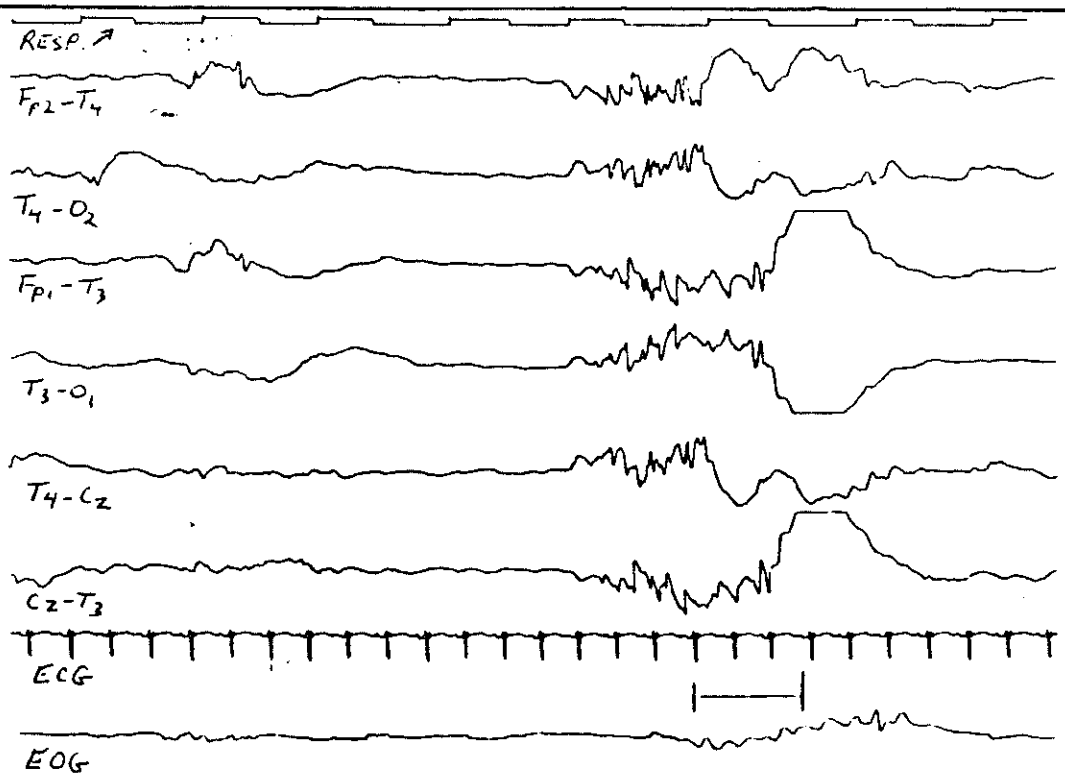


G.A. 34½ weeks **AWAKE**



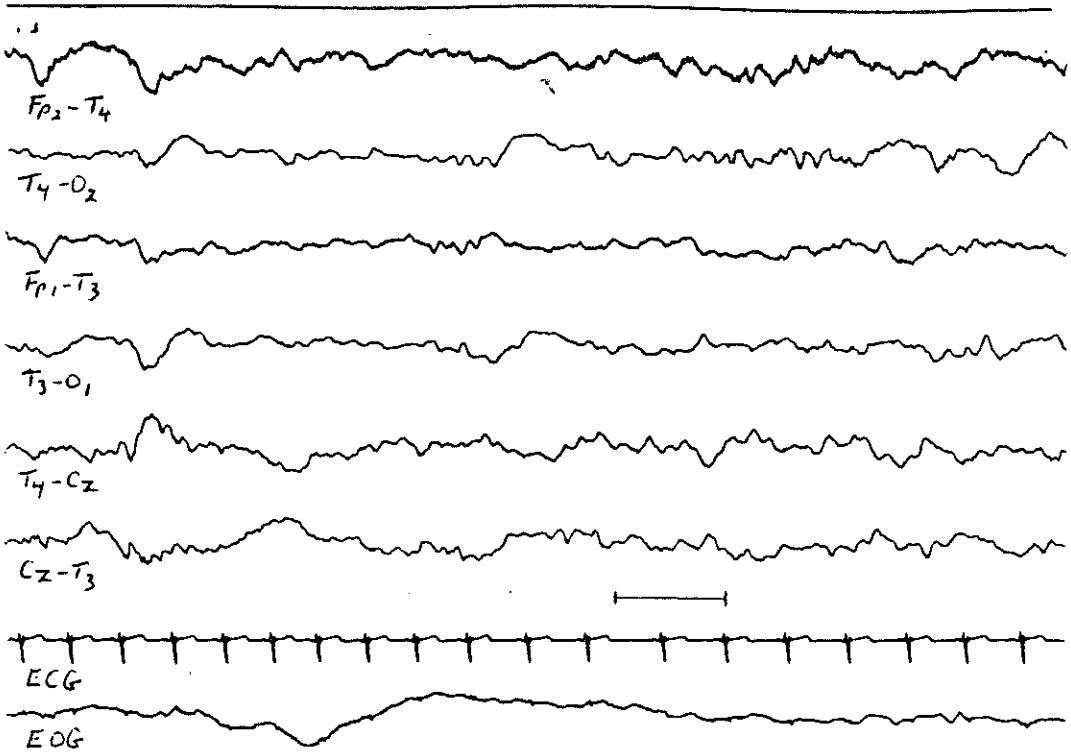
G.A. 30 weeks QUIET SLEEP

- intervals of BACKGROUND SUPPRESSION lasting 10 seconds, interrupted by bursts of high amplitude slow waves with superimposed sharp waves and spikes lasting 2-3 secs. (see below)



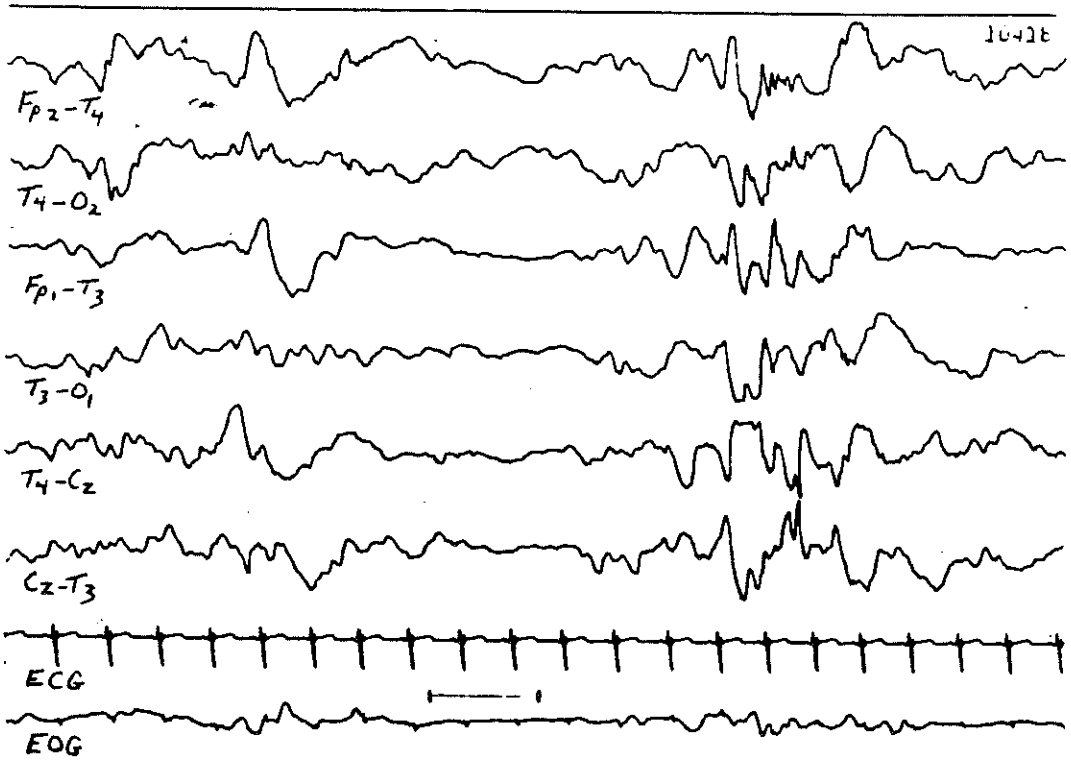
G.A. 30 weeks QUIET SLEEP

- the characterisitc feature in Q.S. in early prematurity is "DISCONTINUITY OF EEG"
- spike and sharp wave discharges looking like epileptic paroxysmal activity are a constant feature of normal prematures



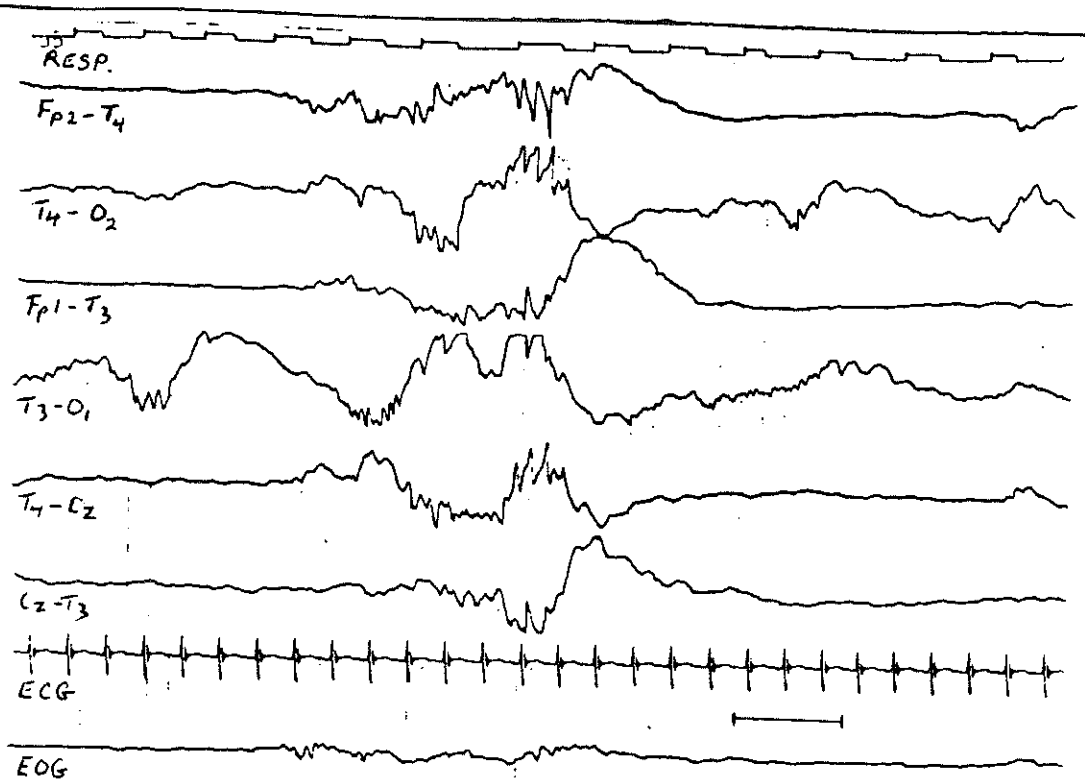
G.A. 41 WEEKS ACTIVE SLEEP

- the background is continuous
- low amplitude mixed fequencies of 5-12 hz. uniform over the hemispheres
- slower activity is intermixed but not dominant



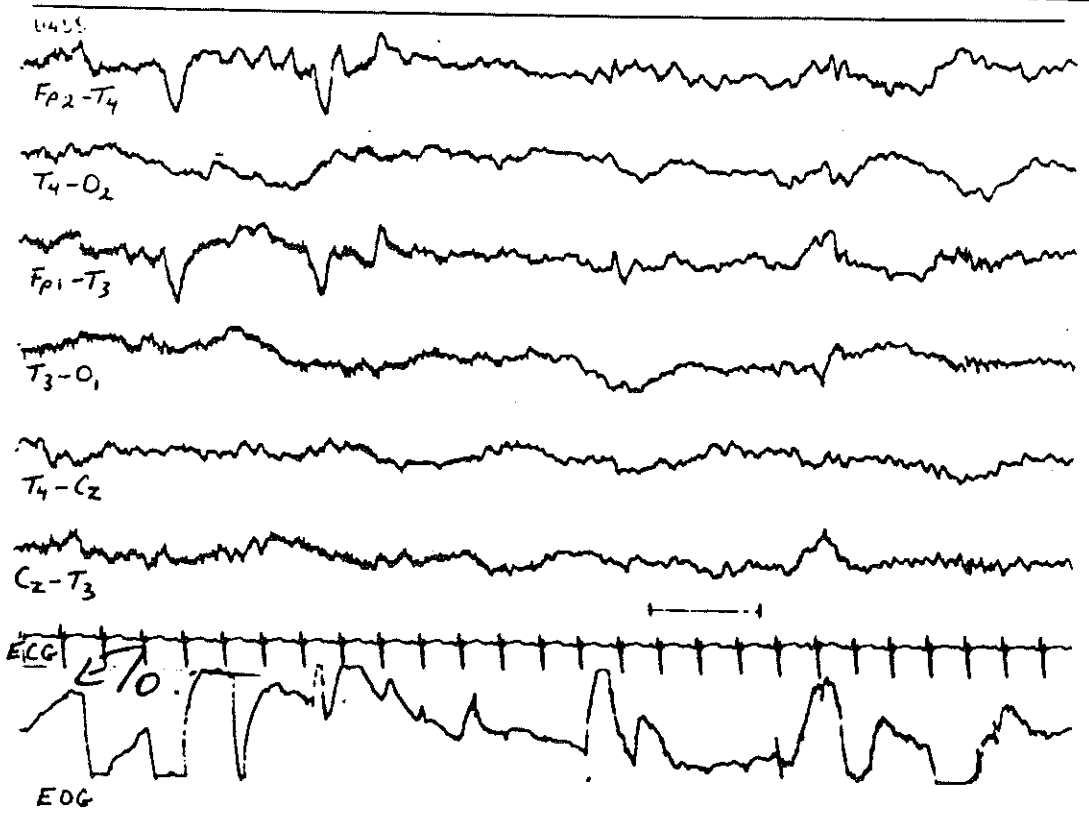
G.A. 41 weeks QUIET SLEEP - TRACÉ ALTERNANT

- quiet sleep at term has 2 patterns: a diffuse continuous slow wave pattern , and trace alternant which is bursts of slow (1-3 hz) appearing every 4-5 sec. and faster (4-7 hz) lower amplitude activity between bursts



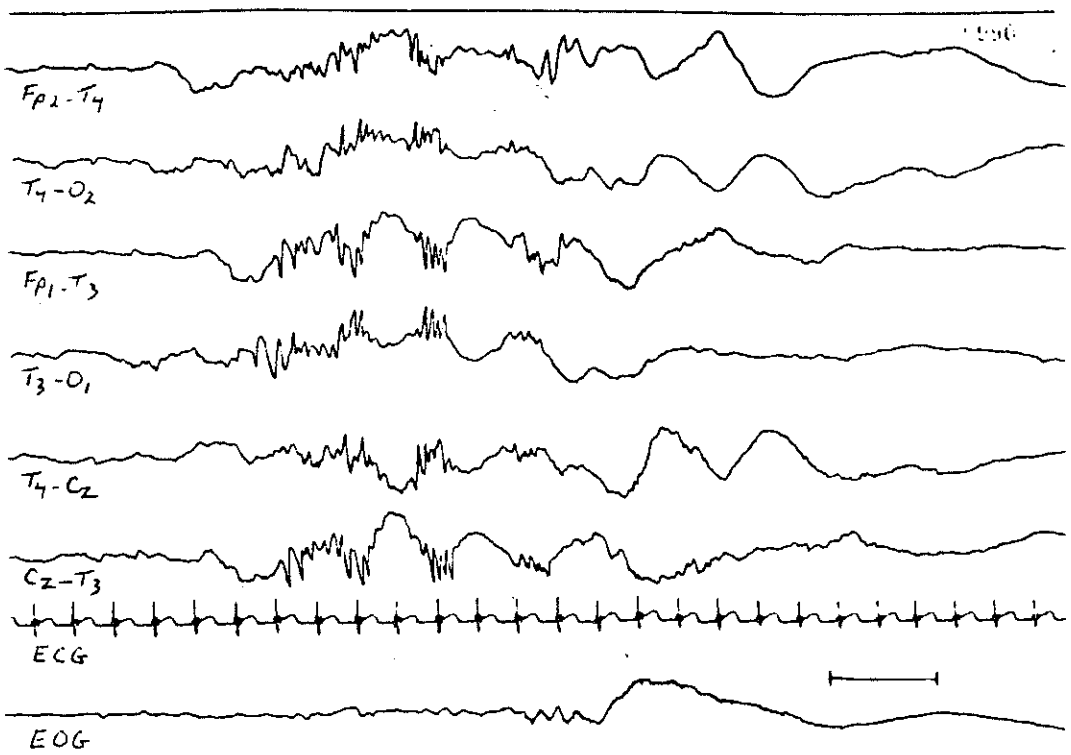
G.A. $32\frac{1}{2}$ weeks QUIET SLEEP

- remains discontinuous
- periods of discontinuity become shorter in duration and contain low amplitude fast frequencies



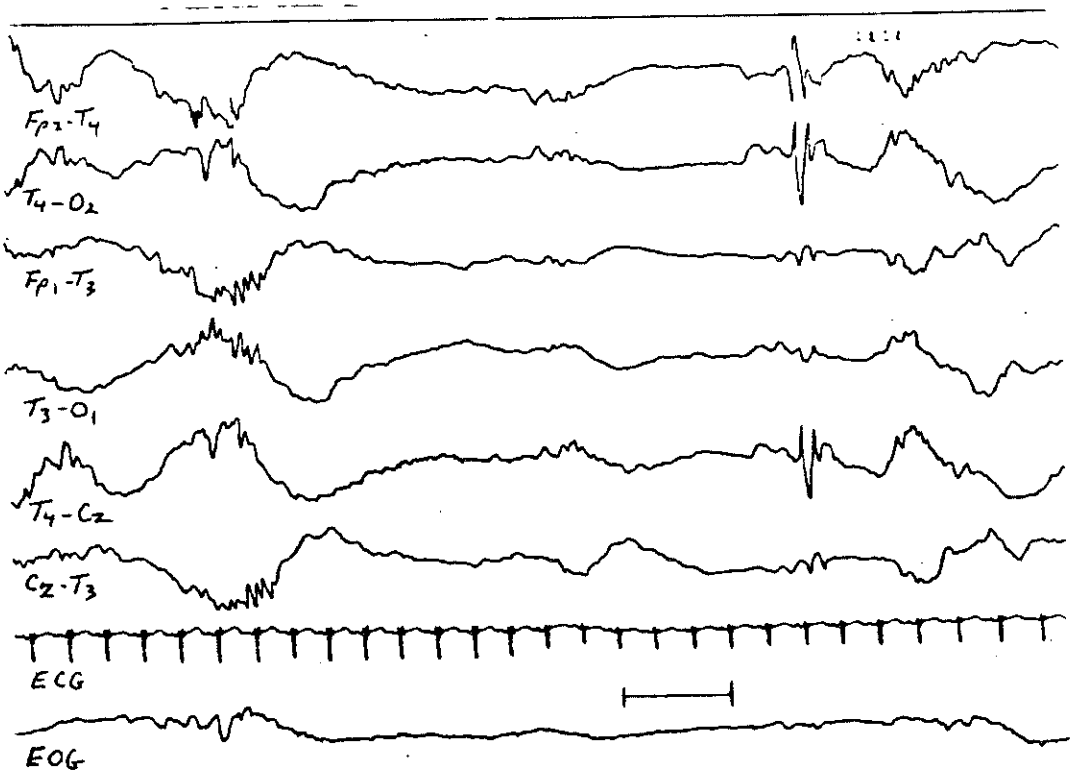
G.A. 41 weeks AWAKE

- background is continuous
- low amplitude 5-7 hz uniform over hemispheres
- frontal sharp transients are common

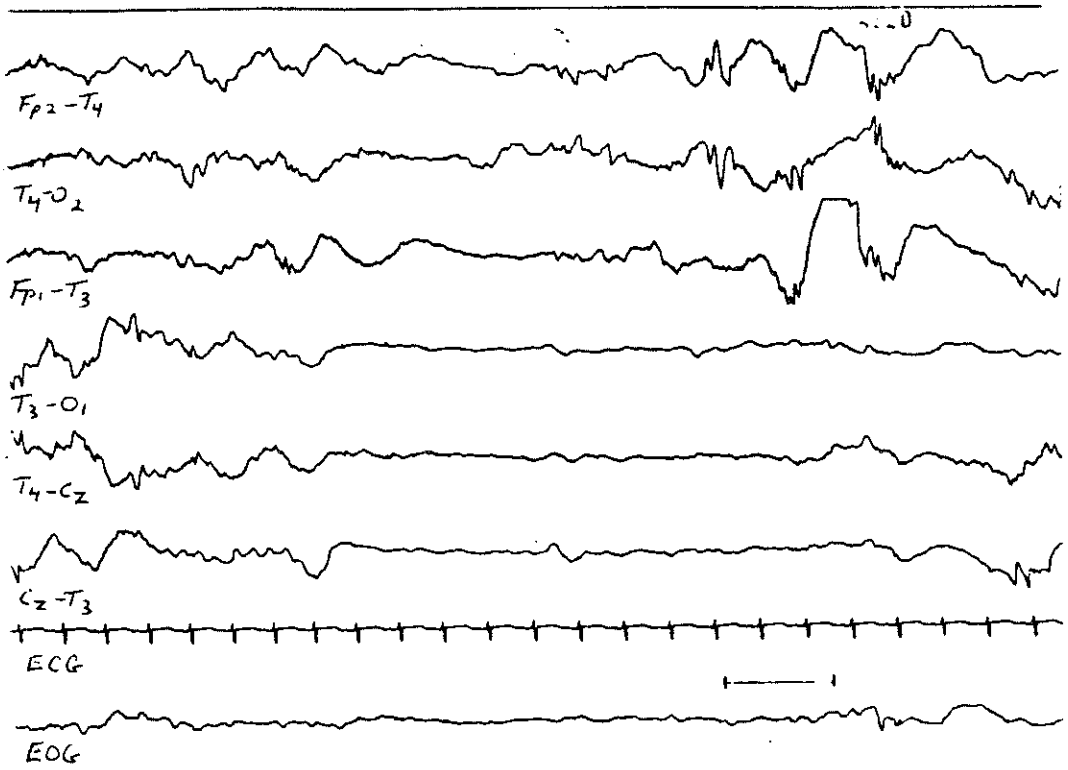


G.A. $32\frac{1}{2}$ weeks BRUSH DELTA

- common feature of early prematurity
- bursts of slow waves with superimposed fast frequencies, can look quite spikey



G.A. 30 weeks SPIKE DISCHARGES - normal feature of early prematurity



G.A. 34½ weeks ASYNCHRONY - normal feature of prematures and young infants

The most difficult decision to make, when reading a premature EEG, is whether "those spikes" are normal or abnormal. Spike and sharp wave discharges looking like epileptic paroxysmal activity are a constant feature of normal prematures and newborns. They can occur as single spikes or poly spikes, and they can appear in all locations, synchronously or asynchronously. Their frequency does decrease with maturation.
It is essential to record for at least 30 minutes to differentiate the abnormal from the normal by its persistent focality.

****

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Atlas of Neonatal Electroencephalography, by Werner, Stockard & Bickford
Raven Press, N.Y. 1977.

Neonatal Neurology, by Gerald Fenichel
Churchill Livingstone Inc. 1980.

Patsy Wilcox
Royal Children's Hospital
Brisbane

MEDICAL MADNESS (FROM STUDENTS EXAM PAPERS)

THREE KINDS OF BLOOD VESSELS ARE ARTERIS, VENIS AND CATERPILLARS

A THERMOMETER IS AN INSTRUMENT FOR RAISING TEMPERANCE

TYPNOID FEVER MAY BE PREVENTED BY FASCINATION

IF CONDITIONS ARE NOT FAVOURABLE, BACTERIA MAY GET INTO A PERIOD OF ADOLESCENCE

VEGETATIVE PROPAGATION IS THE PROCESS BY WHICH ONE INDIVIDUAL MANUFACTURES ANOTHER INDIVIDUAL BY MISTAKE

BLOOD FLOWS DOWN ONE LEG AND UP THE OTHER

A PERSON SHOULD TAKE A BATH ONCE IN THE SUMMERTIME AND NOT QUITE SO OFTEN IN THE WINTERTIME

WHEN YOU HAVEN'T GOT ENOUGH IODINE IN YOUR BLOOD, YOU GET A GLACIER

IT'S A WELL KNOWN FACT THAT A DECEASED BODY WARPS THE MIND

FOR FAINTING: RUB THE PERSON'S CHEST, OR, IF A LADY, RUB HER ARM ABOVE HER HAND

FOR FRACTURES: WIGGLE THE LIMB GENTLY BACK AND FORTH TO SEE IF IT'S BROKEN

FOR NOSE BLEED: PUT THE NOSE LOWER THAN THE BODY

TO REMOVE DUST FROM THE EYE: PULL THE EYE OVER THE NOSE

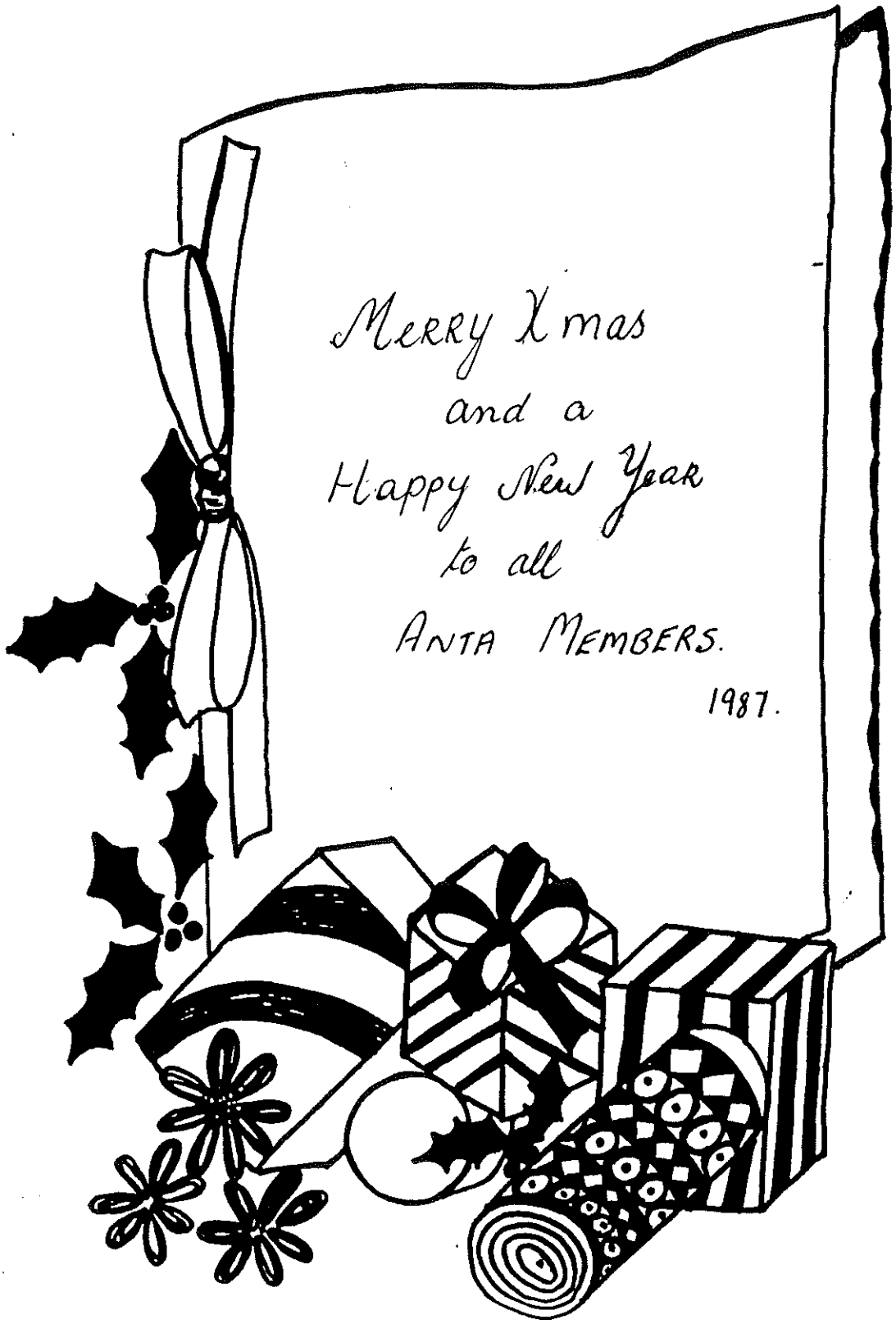
FOR HEAD COLDS: USE AN AGONIZER TO SPRAY THE NOSE UNTIL IT DROPS INTO THE THROAT

FOR SNAKE BITE: BLEED THE WOUND AND RAPE THE VICTIM IN A BLANKET

FOR ASPHYXIATION: APPLY ARTIFICIAL RESPIRATION UNTIL THE PATIENT IS DEAD

STUDENT'S WORK ???

FROM: SIR CHARLES GAIRDNER HOSPITAL
THE QUEEN ELIZABETH II MEDICAL CENTRE
NEDLANDS, W.A. 6009


Merry Xmas
and a
Happy New Year
to all
ANTA MEMBERS.
1987.

MOVING TOWARDS A PAPERLESS EEG RECORDING SYSTEM

S.KAMALDEEN
DEPARTMENT OF CLINICAL NEUROPHYSIOLOGY
ROYAL HOBART HOSPITAL

Almost all multichannel EEG machines in use today rely on bulky fanfold paper and ink for their output. Although in the last ten years there have been various other mediums such as magnetic tape and heat sensitive paper for specialized purposes (ambulatory monitoring and cerebral function monitoring) ,none had been as versatile or as cheap as paper and ink for everyday use. Further the vast majority of EEG machines in use today can only give one dimentional realtime output on paper without any means for offline machine processing and analysis of the data.

This situation has changed to a certain extent with the advent of cheap and powerful computers which are capable of storing a vast amount of EEG data and presenting it as topographic maps or as tables. With the addition of a Medilog 9000 Ambulatory System just over a year ago, EEG recording in our department became partially 'paperless'. We made a significant move towards a fully 'paperless' system with the acquisition of a Cadwell Spectrum 32 . It is an integrated system capable of a range of evoked potentials in addition to multichannel EEG recording , topographic mapping and quantitative EEG analysis. The permanent recording medium is a 240 megabyte optical laser disk the size of a notebook capable of storing upto 36 hours of EEG normally requiring about 1.5 metres of shelf space if recorded on paper. The cost of a disk is about $30 as against over $700 for about 12 packets of paper.

It is not my intention to describe the various features of this particular equipment except to highlight some of the advantages and disadvantages in relation to its possible replacement of the familiar paper based EEG machine. The EEG scrolls past on the very high quality screen from left to right whilst simultaneously being recorded on the WORM (write once read mostly) laser optical disk. Although 32 channels are provided, 16 to 21 is a more practical number for optimum clarity for routine work. Comments are entered via the keyboard , e.g, 1 for 'Eyes open' etc. Needless to say most of the parameters including recording montages are user definable. The resolution of the special graphics card at 1280 x 1024 (with 1024 x 800 displayed pixels) is the best available on the market , far exceeding the quality obtainable in much more expensive systems. Because of this high resolution digitised EEG is not significantly degraded in the Spectrum 32.

I have long held the view that , once started recording must continue uninterrupted so that even the briefest abnormal paroxysm , often the sole abnormality in the record, is not lost. One way such unnecessary interruptions can occur is due to frequent and elaborate recording montage changes. Fortunately in most modern machines montage changes can be effected within a fraction of a second. Unfortunately the

Spectrum 32 falls short in this regard. Fifteen seconds (equal to 1.5 pages) are lost while the machine sets up the next montage and resumes recording. This is quite unacceptable and hopefully the next software update and possibly the inclusion of an 80386 speed up card will eliminate this problem. This shortcoming is however partially overcome in the Spectrum 32 by the fact that it is possible to record an entire EEG in real time in only one or two montages and subsequently reconstitute the EEG using different montages. A synthesized voice prompt is provided for checking the impedance of individual electrodes but the electrode has to be first selected using the pointing device (Mouse). Hopefully the next software update will provide a more intelligent self selecting method for checking impedance.

During replay selected pages may be printed out on the very slow IBM 16 colour ink jet printer or on a very fast laser printer which can also give a continuous printout. Although the Spectrum 32 can be connected to a conventional EEG recorder for analogue output , the facility only appears to work in realtime and not during replay . This is a notable omission . Gain and filter settings can be changed during replay. The topographic maps produced by the Spectrum 32 are of very high quality due to its special graphics card.

The Spectrum 32 is built around the IBM AT computer and comes with a huge 70 megabyte hard disk,two 1.2 megabyte floppy disk drives and a 240 megabyte laser optical disk drive. With these facilities it can also be used for general purpose computing. At around AUS$100,000 the Spectrum 32 may at first look prohibitively expensive. However it offers many more features not available on a conventional paper based machine,the best of these already costing around AUS$70,000. The operation being software based , the Spectrum 32 is capable of future enhancements and refinements in a way conventional machines are not.

21st October 1987

Linda Welch
EEG Department
Royal Children's Hospital
BRISBANE QLD 4029.

PATTERN STIMULATION

It has been reported in many papers that patients referred for the investigation of epilepsy, 5% are found to be photo-sensitive, using conventional photic stimulators. Furthermore it has been found that of these patients who are photo-sensitive, upto 70% are also pattern sensitive.

A paper by Darby gives 2 case histories of adults a 20 and a 56 year old.

A theory has been raised by Neurologists that photo-sensitive patients who have spontaneous seizures were perhaps at the time of their attacks unknowingly subjected to some form of pattern stimulus. Routine pattern testing of all patients referred for epilepsy was therefore suggested. On the other hand it has been found that, no patient was consistently pattern sensitive only, (not photo-sensitive).

It is of interest, that here at the Royal Children's Brisbane, one of our patients has been shown to be sensitive only to pattern stimulation on 2 visits to the department.

The benefit of determining pattern sensitivity is to advise the patient, family and friends, so that the incidence of attacks may be reduced. For example, in the choice of fabrics in clothing and home furnishings, also they must be aware of possible stimuli outside the home, such as escalators, grills and gratings.

To produce pattern stimulus cards, follow parameters set out in a particular paper. Your first stimulus card should be a maximally epileptogenic pattern, being parallel black and white stripes of equal width in a circular black surround.

Commercially available "letraset" is an ideal medium.

The parameters I have used were obtained from a paper by Darby, Wilkins, Binne and de Korte and are as follows:

(1) Alternating black and white stripes 2.5mm wide.

(2) Circular outline 48 cm, mounted on stiff cardboard.

(3) Viewed at distance of 57 cm (arm's length).

Important factors in determining pattern sensitivity are:

(a) the distance of the stimulus from the patient and the size of the pattern.

Visual angle is the angle that the total pattern subtends at the eye. This angle should be greater than 16°. No optimal angle is given, but a 480mm

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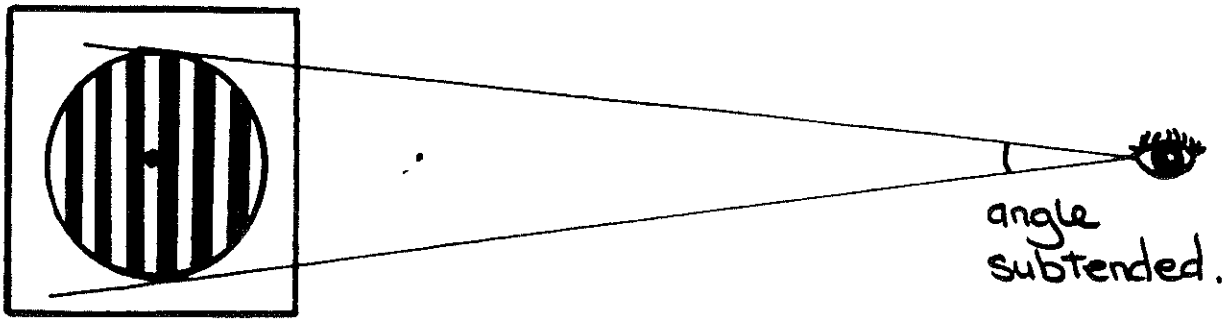
in diameter, pattern at a distance of 570 mm gives a 45° visual angle.

VISUAL ANGLE



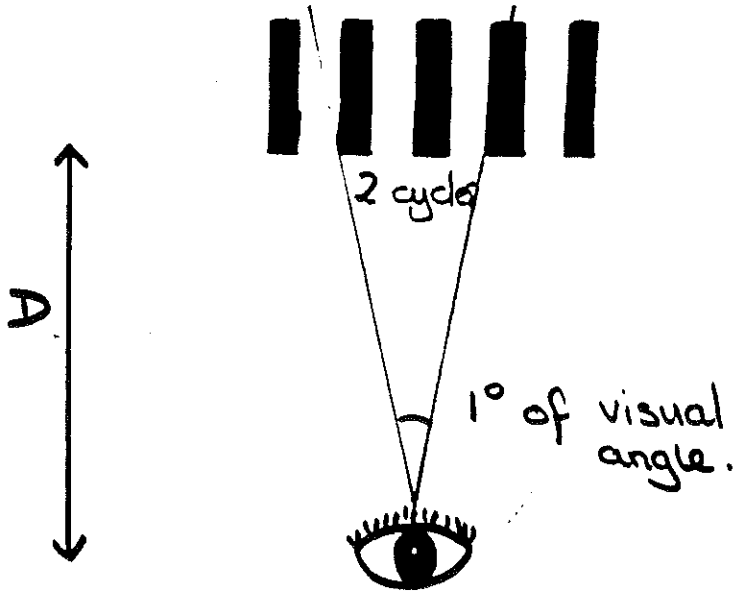
(b) Illuminance of the stimulus. Use a well lit room, if necessary focus the beam of light from an empty projector onto the stimulus.

Do not use photic stimulator to illuminate cards as this will confuse results.

Don't use pattern stimuli on slides through a projector, as a good black to white contrast is difficult to achieve.

(c) Spatial Frequency is determined by the width of the stripes and the frequency that pairs of black and white stripes repeat.

SPATIAL FREQUENCY



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The most suitable spatial frequency is 2 cycles per degree of visual angle and it would be extremely rare to be sensitive outside of 1 & 4 cycles.

OTHER REQUIREMENTS

(i) Plain black card - for baseline and intermediate recordings
- use reverse side of stimulus

(ii) Black surrounds - adhered to each stimulus.

(iii) Extra mask surrounds of varying sizes - to reduce the aperture for extremely sensitive patients.

(iv) A range of stimulus cards,

- stripes are most epileptogenic
- checks - small (2.5mm) and larger
- wavy lines
- fabric samples.

(v) All cards should be marked with a central red dot for the patient to fixate on.

PROCEDURE

The following guide is the procedure adopted at RCH Brisbane.

1. You may wish to use a slow paper speed as pattern testing can consume reams of paper.

2. First record a baseline EEG, with eyes open, viewing the plain black card.

3. Use maximal epileptogenic pattern at the correct distance. Hold the card so that the stripes fall vertically (most epileptogenic).

4. Hold the stimulus card stationary and ask the patient to fixate at the centre of card. Hold for at least 30 seconds, unless a convulsive response occurs.

5. If a convulsive response occurs remove the stimulus immediately, or turn over to plain black card. It is best to have an assistant to hold the cards.

6. If patient is extremely sensitive use a smaller surround to reduce the surface area.

   The EEG should always return to the resting state before proceeding.

7. Next vibrate the pattern at right angles to the parallel lines for at least 30 seconds.

8. Turn card 90° to horizontal and hold stationary - 30 seconds.

9. Vibrate at right angles - 30 seconds.

10. It may be of interest to try stimulation at double and half distances. To precipitate or abolish any convulsive response.

11. If patient is found to be sensitive, try patching one eye and asking the patient to wear dark glasses (if available) to diminish any activity.

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CASE HISTORIES RCH

No.1

Male aged 14 years

Developed minor epileptic attacks aged 10, consisting of shuddering movements of the arms and shoulders, often occurring when watching T.V. sometimes occurring spontaneously. Well controlled with Epilim.

The routine EEG showed no abnormal activity at rest or on hyperventilation. Photic stimulation showed paroxysmal, generalised, spike and wave activity at 10 - 15 flashes per second.

Pattern stimulation also showed paroxysmal activity (though a reduced amplitude response compared to photic stimulation) to stationery, vertical and horizontal stripes.

An abnormal response was recorded less than 2 seconds after stimulus card held stationary after vibrating.

This was an unusual finding as the majority of patients have been more sensitive to vibrating patterns.

No.2

Female age 4 2/12 years, referred age 4 to Neurologist suspected of being pattern sensitive. The child noticed by mother to be attracted to particular patterns, especially stripes, and would stare vacantly until physically averted.

The routine EEG showed a single bitemporal paroxysm of sharp wave activity at rest and a left posterior temporal asymmetry. Hyperventilation and photic stimulation showed no significant effect (including stimulation on eye closer).

Pattern stimulation, with stimulus held at 57 cms (as parameters dictate) no abnormal response could be elicited. But it was found by moving the stimulus to approximately 100 cms generalised bursts of irregular spike and wave activity appeared with vertical and horizontal stripes, held stationary or vibrating. It was also determined that by moving the stimulus back and forth 57 ↔ 100 cm, was fairly provocative in this child.

Upon leaving the department, a relative of the next patient happened to be wearing a red and white narrow striped skirt and the child became attracted to the pattern, staring vacantly until mother pulled the child away.

This case was particularly interesting as she was pattern sensitive only, not photo sensitive. This child has returned to our department since and the same findings were recorded.

One other interesting point is the age of this child. The youngest case history I could find elsewhere was 6 years.

... 5

No. 3

Female aged 12 years. At age 7 years began having generalized seizures while watching T.V. at close range, occasionally occurred spontaneously and occasional "spells" in the car. She suffered enuresis day and night and her school performance has fallen well below average. She appeared a shy, withdrawn child when seen in our department.

The routine EEG showed occasional bilateral bursts of 2-3cps spike and wave activity at rest and on hyperventilation.

During photic stimulation prominent bursts of generalised poly spike and spike and wave activity were seen at flash rates 7 - 40, often associated with myoclonic jerks of the head and arms.

At the time of testing she was on Tegretol medication.

During pattern stimulation she proved to be also extremely sensitive, showing generalized spike and wave activity as prominent as the response seen with photic stimulation. She was extremely sensitive to all patterns shown to her, whether stationary or vibrating, including a check pattern with 2 cm squares.

The aperture of the patterns needed to be reduced, using mask surrounds, to a diameter of 14.5 cm before the abnormal response diminished. Patching one eye caused no significant change and at no time during pattern stimulation were myoclonic jerks noted.

TO CONCLUDE

Here at the Royal Children's Hospital, Brisbane we have over the last 12 months found 57% or 8 out of 14 patients tested to be pattern sensitive, the criterion for pattern testing being photosensitivity or a suspicion of pattern sensitivity.

REF: Routine testing for Pattern Sensitivity.
Journal of Electrophysiological Technology
Darby, Wilkins, Binne, de Korte.

Association of Neurophysiological Technicians of Australia (ANTA)

11th NATIONAL CONFERENCE

ROYAL NORTH SHORE HOSPITAL

SYDNEY

Saturday 7th and Sunday 8th May 1988

We hope that the 11th National Conference will be interesting and enjoyable as in the previous years. The program promises to be wide ranging and we will try to accommodate any ideas and suggestions you make if at all possible.

A printed 'advance notice' will be sent out in the New Year so that you have time to apply for hospital financing.

Unfortunately Sydney will be a very expensive place in the Bicentennial year. We cannot get a firm cost for motel accomodation but it will probably be over $100 per room. We shall billet as many people as possible but on a 'first come, first served' basis.

The Bennelong Restaurant at the Sydney Opera House has been booked for the conference dinner. It is a very pleasant venue with a splendid view of the Harbour Bridge. The cost will be $40 per head and $45 for accompanying guests, as conference delegates will be subsidised at $5 per head.

The registration fee will probably be $35 but the cost of the conference dinner will be included in the registration fee printed on the registration form. If you do not wish to attend the dinner you will be asked to deduct $40 from the fee.

Marie Zouthout of the RMIT will be pleased to arrange two RMIT sessions on Friday 6th May. These may take any form you wish e.g. teaching/or trouble shooting. If this proves popular, an 'RMIT day' could become a regular feature of the conference.Please contact her with your ideas.

Melbourne-663 5611/Extension 289

Medical Applications has been very generous and will sponsor a 'hospitality evening' on the Friday evening. This will give us an opportunity to renew old acquaintances and meet people for the first time before the conference. There never seems to be enough time to catch up on the news during the conference breaks.

The Australian Association of Neurologists (AAN) Conference will be held Tuesday 10th - Thursday 12th May.

Interstate visitors may wish to visit some Sydney departments on the free day between the two conferences, so Monday 9th May could be an open day.

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A few subjects suggested for the program are;

- A four corner workshop
- Sleep apnoea
- Document management
- Movement disorders
- Anal sphincter recording
- Updates on last years papers
- A quiz (anonymity preserved apart from the winner)

Please think about compiling a poster. We could keep a blank space for your 'Handy Hints' and a display table for interesting records - very popular at last year's conference.

ANY OTHER IDEAS? PLEASE LET US KNOW!!

Conference organisers; Thelma Leonard
&
Michele Cott

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Association of Neurophysiological Technicians of Australia (ANTA)

I WISH TO PRESENT;

a paper .....

a demonstration .....

APPROXIMATE TIME REQUIRED .....

AUDIO/VISUAL AIDS REQUIRED;

slide projector .....

overhead projector .....

video recorder (VHF or Beta) .....

other (please specify) .....

OTHER EQUIPMENT REQUIRED (please specify) .....

TITLE OF PRESENTATION .....

Please compile abstract for distribution prior to conference.

NAME .....

ADDRESS .....

.....

.....

CONTACT TELEPHONE NUMBER

.....

PLEASE RETURN TO;

Thelma Leonard
Department of Clinical Neurophysiology
Repatriation/General Hospital
Hospital Road
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