

# ICRP and As Low As Reasonably Achievable in Medical Sector

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INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

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Per Strand

ICRP is the organization that  
introduced recommendation  
on “As Low As Reasonably  
Achievable”



# A bit of History

# INTERNATIONAL RECOMMENDATIONS ON RADIOLOGICAL PROTECTION

January 1951, Page 1

- Whilst the values proposed for maximum permissible exposures are such as to involve a risk which is small compared to the other hazards of life, nevertheless **in view of the unsatisfactory nature of much of the evidence**, coupled with the knowledge that certain radiation effects are irreversible and cumulative, it is strongly recommended that every effort be made to reduce exposures to all types of ionizing radiations to the lowest possible level.

# Basis

- Based on occupational protection
- Had dose limit in perspective
- Unsatisfactory nature of evidence
- Effect irreversible
- Cumulative

# RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

September 9, 1958

- ..it is highly desirable to keep the exposure of large populations at as low a level as practicable, with due regard to
- The Commission recommends that medical exposure be considered separately and that it be kept as low as is consistent with the necessary requirements of modern medical practice

# RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

September 17, 1965

- The Commission recommends that any unnecessary exposure be avoided, and that all doses be kept as low as is readily achievable, *economic and social considerations being taken into account*



## IMPLICATIONS OF COMMISSION RECOMMENDATIONS THAT DOSE BE KEPT AS LOW AS READILY ACHIEVABLE PUBLICATION 22, APRIL, 1973

- to provide for operational control of specific procedures, both individually and in combination, so that the resulting doses are as low as is **reasonably\*** achievable, economic and social considerations being taken into account;
- \* The adverb "readily" has been replaced by "reasonably" because it now appears to the Commission that "reasonably" more closely describes its intentions.



# Medical Exposure

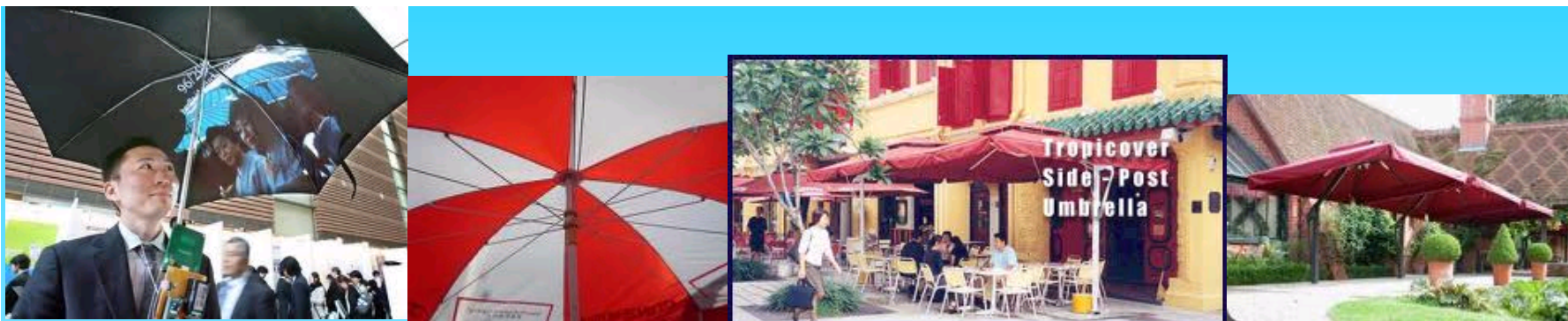
- It forms part of Commission's principle of Optimization of protection
- Two source related principles apply to all exposure situations: Justification, optimization

# ICRP Publication 105



(70) The optimisation of radiological protection means keeping the doses ‘as low as reasonably achievable, economic and societal factors being taken into account’, and is best described as:

- *management of the radiation dose to the patient to be commensurate with the medical purpose*



- 3.6 billion x-ray examinations per year
- 35 million nuclear medicine examinations
- 5 million patients radiotherapy treatments

**Everyone amongst us is a patient sometime**



Is this justified?

Is this Optimized?

But still it happens

Did anyone see this  
6 years ago, as a  
result of CT?

NO

New Situation

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THE RADIATION BOOM

## After Stroke Scans, Patients Face Serious Health Risks

By WALT BOGDANICH

Published: July 31, 2010

When Alain Reyes's hair suddenly fell out in a freakish band circling his head, he was not the only one worried about his health. His co-workers at a shipping company avoided him, and his boss sent him home, fearing he had a contagious disease.

[Enlarge This Image](#)



Hair loss in patients who received radiation overdoses.

Only later would Mr. Reyes learn what had caused him so much physical and emotional grief: he had received a radiation overdose during a test for a [stroke](#) at a hospital in Glendale, Calif.

Other patients getting the procedure, called a CT brain perfusion scan, were being overdosed, too — 37 of them just up the freeway at Providence Saint Joseph Medical Center in Burbank, 269 more at the renowned Cedars-Sinai Medical Center in Los Angeles and dozens more at a hospital in Huntsville, Ala.

The overdoses, which began to emerge late last summer, set off an investigation by the [Food and Drug Administration](#) into why patients tested with this complex yet lightly regulated technology were bombarded with

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**CYRUS**  
NOW PLAYING



# Over-exposure: 2010 Regulatory actions



Besides accidental exposures

**Some patients**

**undergoing**

**Tens of**

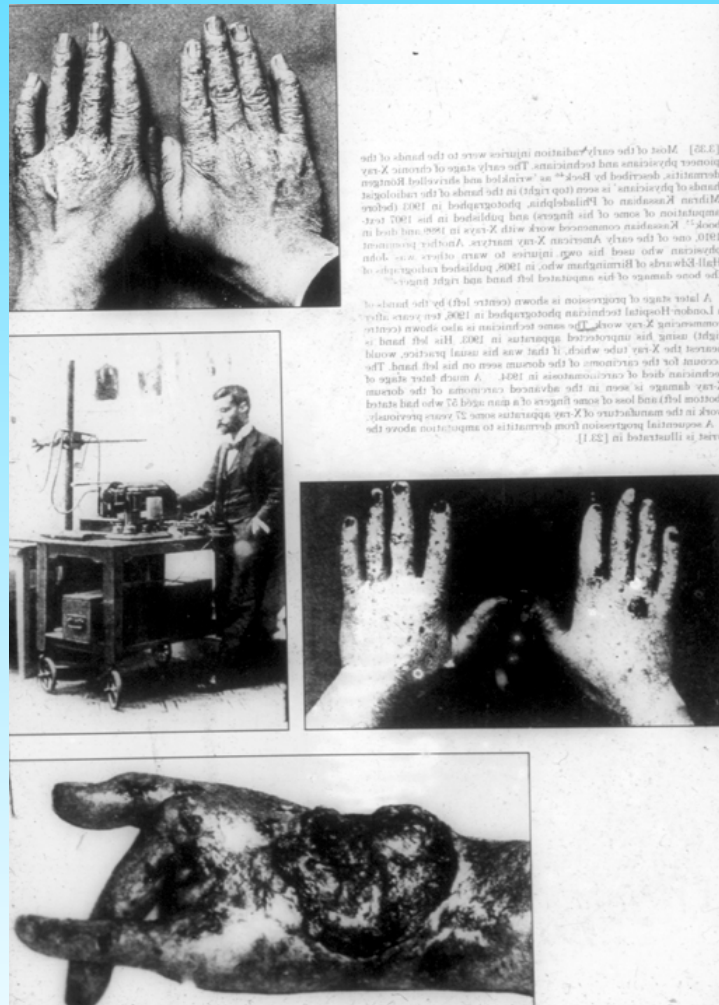
**CT scan in few years**

Again something that has started in this decade



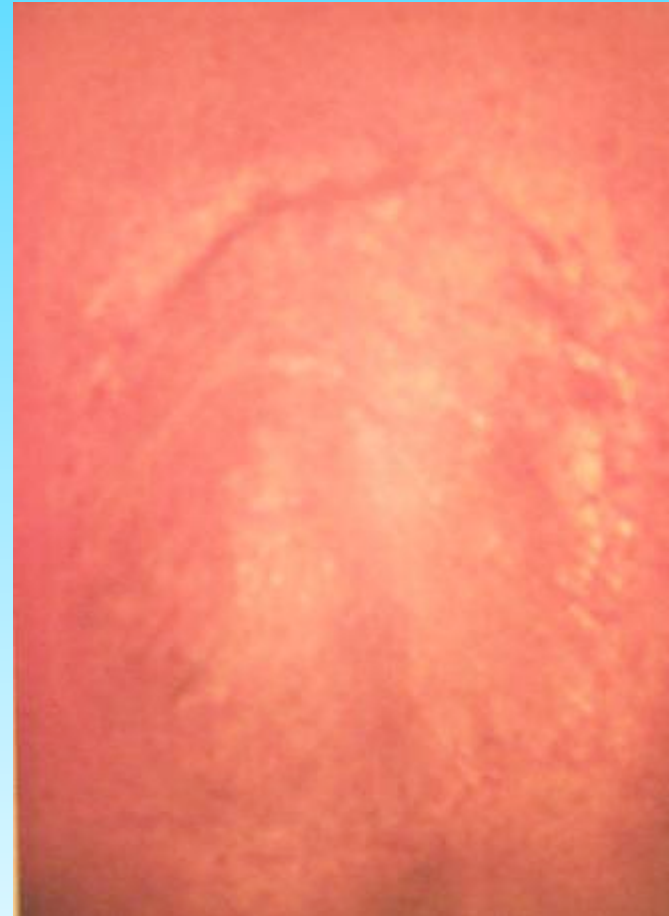


# Almost a thing of past for staff in medical



Color??

# But this is IN



# Patients are having these injuries



# Where do the injuries occur in interventional procedures?

- Severe injuries have occurred from the neck to the buttocks
- Sometimes anteriorly &
- On the side of torso





# Over-exposure of child

## Radiation Overdoses Point U

By WALT BOGDANICH

Published: October 15, 2009

At a time when Americans receive far more d  
ever before, two cases under scrutiny in Calif  
large, well-known Los Angeles hospital, the o  
the northern part of the state — underscore th  
CT scans pose when used incorrectly.

[Enlarge This Image](#)



Roth family

"The problem with this case is that the  
parents are subjected to worry for the  
rest of their lives. They're always  
going to have to worry for years —  
forever — because every time the  
child snuffles they instantly start  
thinking maybe this is the start of  
something really bad."

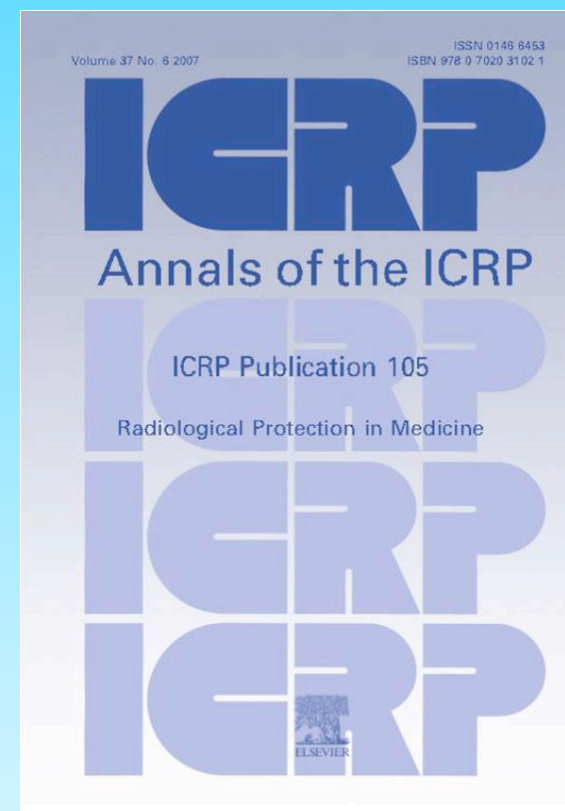
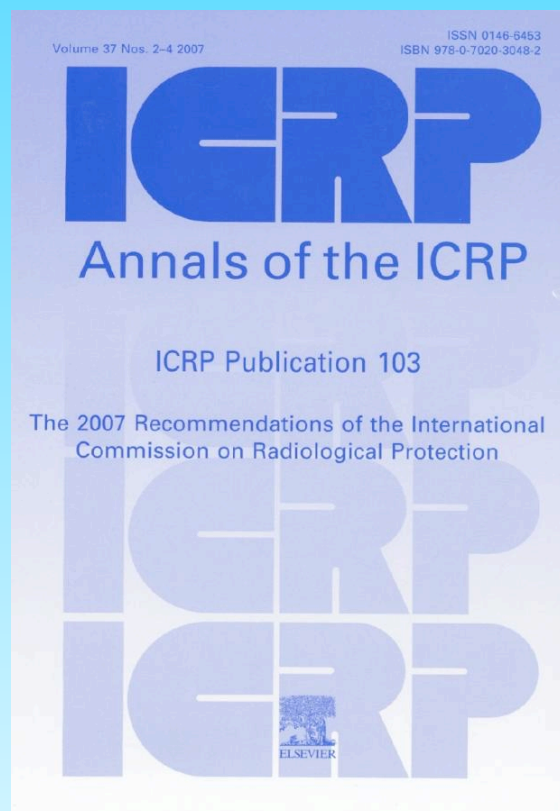
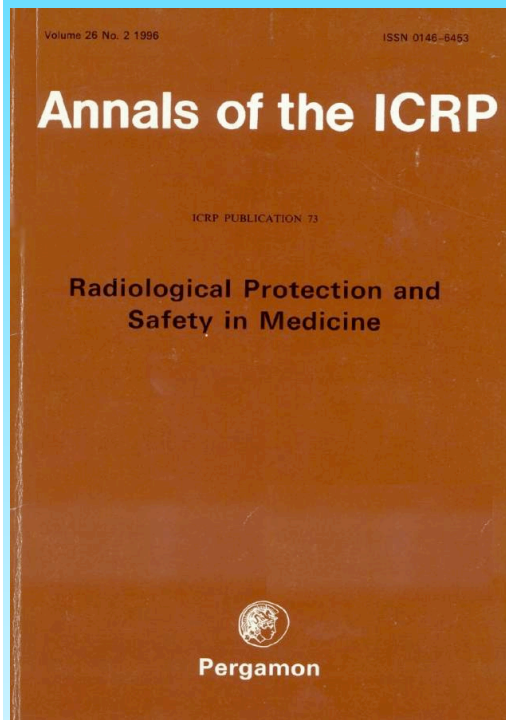
DON L. STOCKETT, a lawyer  
representing the family of the child,  
Jacoby Roth.

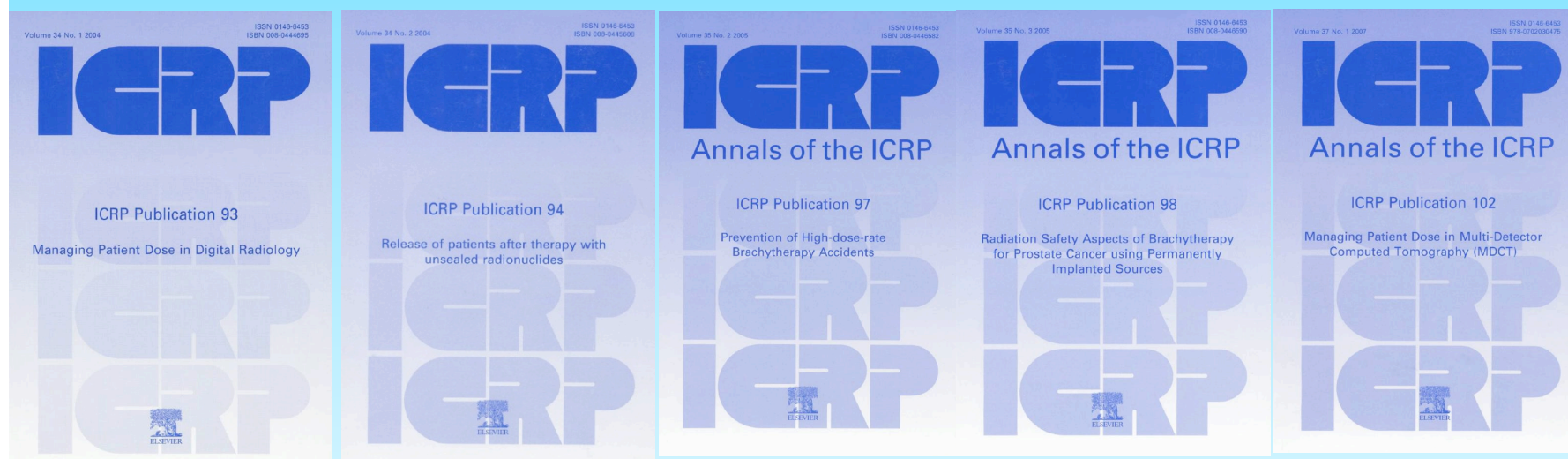
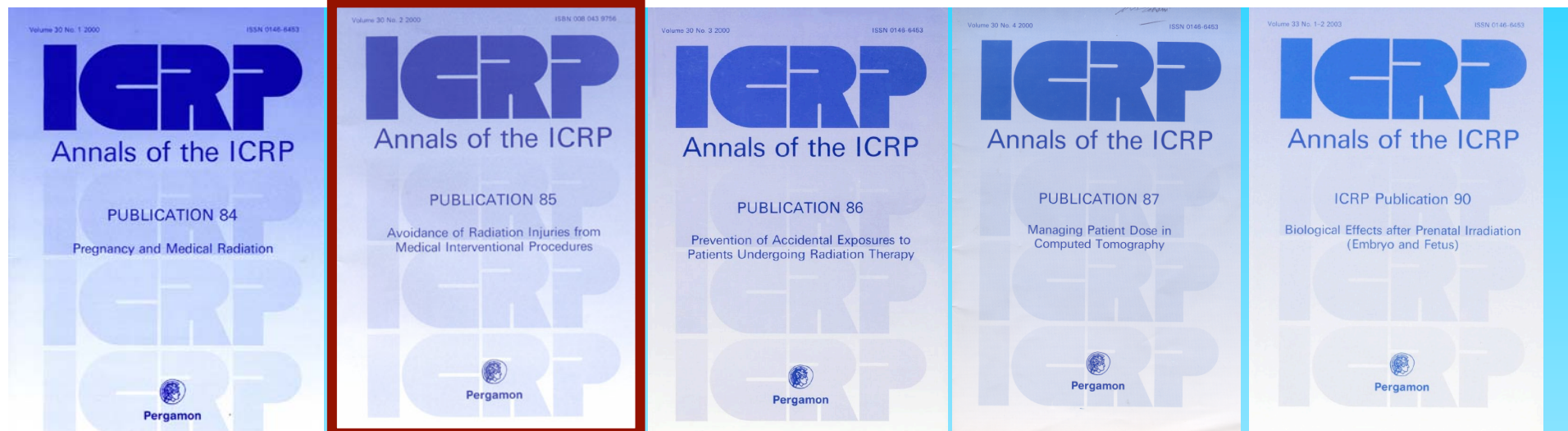
A week ago, C  
Center in Los  
had mistakenl  
eight times th  
to 206 possible  
18-month peri  
intended to ge  
federal health

Hundreds of n  
Hospital in Ar  
old boy compl  
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license for sub

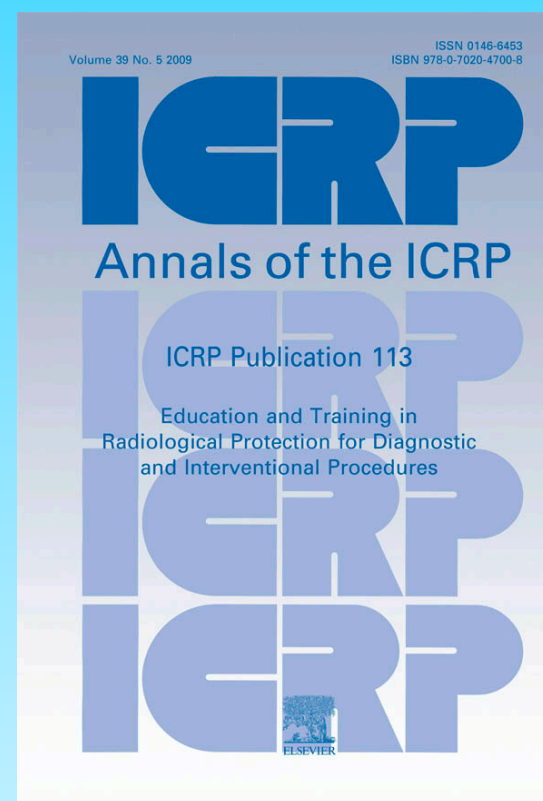
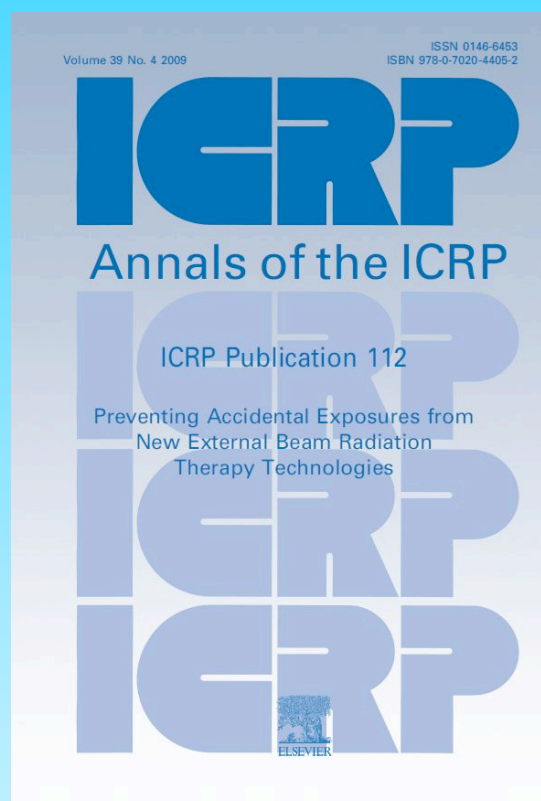
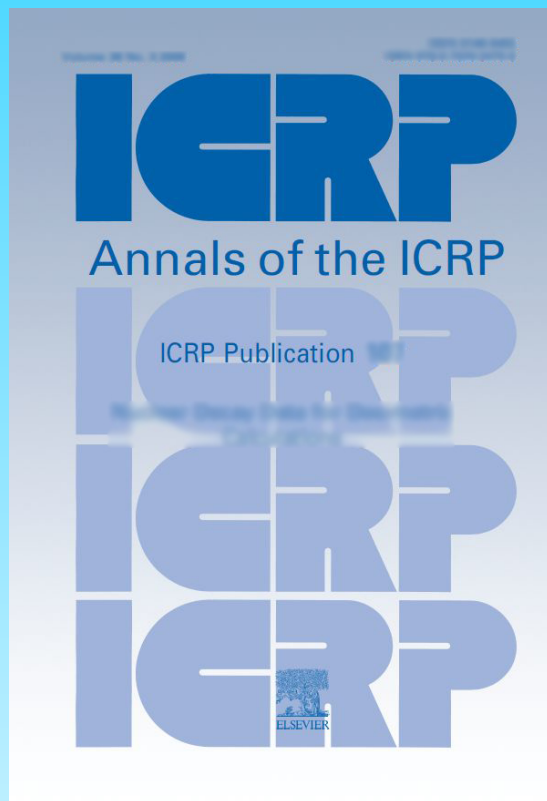


this situation

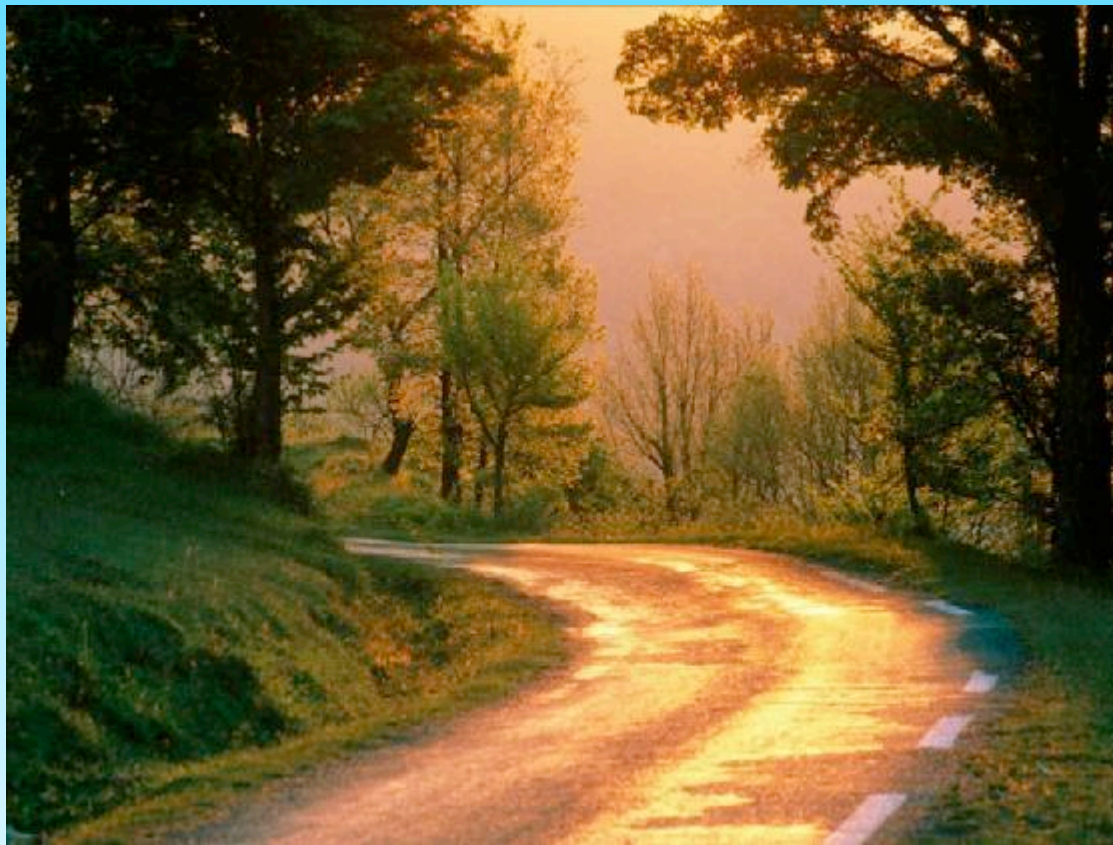








# Miles to go before I sleep-Robert Frost





Let us ALL join hands





Thank You