

SCIENCE DIMENSION



National Research
Council Canada

Conseil national
de recherches Canada

Vol. 10, No. 3, 1978

ISSN 0036-830X

Indexed in the Canadian Periodical Index

CONTENTS

4 Demise of the dinosaurs

What happened 64 million years ago?

10 Coordinating research for the handicapped

Focus on biomedical engineering projects

14 Energy technology

Choices for the future

18 Computer graphics

An aid to medicine

22 Nature's fireworks

Simulating lightning in the laboratory

24 DC versus AC current

An old controversy revived

28 A new NRC invention

Transfer in ultrahigh vacuum

Cover: The dinosaurs disappeared millions of years ago, but the nature of the worldwide environmental crisis that wiped out three-quarters of Earth's life species at the time still remains obscure. Could it have been a solar instability, changes in the configuration of continents and ocean basins, or the explosion of a supernova, depicted here in diminished intensity? (Story page 4.) Detail of painting by Elly Kish. Courtesy National Museum of Natural Sciences, National Museums of Canada.

Science Dimension is published six times a year by the Public Information Branch of the National Research Council of Canada. Material herein is the property of the copyright holders. Where this is the National Research Council of Canada, permission is hereby given to reproduce such material providing an NRC credit is indicated. Where another copyright holder is shown, permission for reproduction should be obtained directly from that source. Enquiries should be addressed to: The Editor, *Science Dimension* NRC, Ottawa, Ontario, K1A 0R6, Canada Tel. (613) 993-3041.

Editor Loris Racine

Managing Editor Wayne Campbell

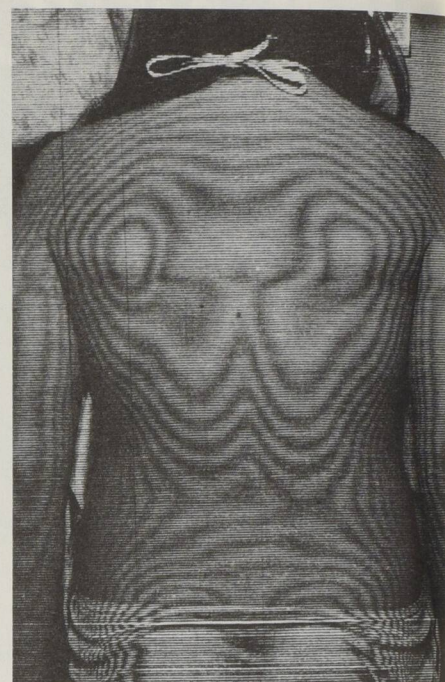
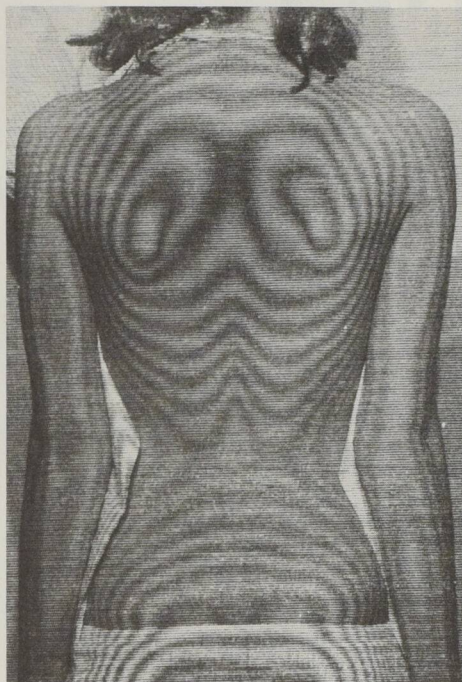
Executive Editor Joan Powers Rickerd

Design John B Graphics Inc.

Editorial Production

Coordinator Diane Bisson Staigh

Detection of childhood scoliosis The answer lies in the shadows



Division of Physics, NRC/Division de physique, CNRC

The shadows or moiré fringes which are projected on the back help to delineate its symmetry. When the spine is normal the patterns on both sides are symmetrical. In contrast, when the child has scoliosis and therefore suffers from a deformed spine the patterns are not symmetrical.

Les ombres, c'est-à-dire les franges moirées, qui apparaissent sur le dos du sujet permettent d'en vérifier la symétrie. Dans le cas d'une épine dorsale normale, les configurations qui apparaissent de part et d'autre du dos sont symétriques (à gauche). Au contraire, lorsque l'enfant est atteint de scoliose, sa colonne vertébrale est déformée et l'on observe une asymétrie dans les configurations (à droite).

Researchers in the Photogrammetry Section of NRC's Division of Physics have contributed to a unique screening procedure for the detection of scoliosis, an idiopathic disease (one of unknown cause) which results in a deformed spine.

Scoliosis is relatively common, afflicting one out of every 10 children. Out of this group 10 per cent of the patients require some corrective treatment. If left unattended the deformity can progress to a point where major surgery is required to straighten the spine.

NRC physicists, in collaboration with a professor of orthopaedic surgery at the University of Ottawa, developed and tested a simple device which, to date, has had a high success rate in the accurate diagnosis of scoliosis.

The make-up of the device is quite simple: a screen of uniformly spaced transverse black nylon strings, a light source and a camera. The child is positioned behind the screen with his or her back parallel to it and a photograph is taken. As the light

passes through the screen, a pattern of lines which appears as shadows on the back is observed and recorded by the camera. These patterns or shadows (technically termed moiré fringes) delineate the surface contours much like the topographical map of a landscape. If the spine is normal, symmetrical moiré fringes appear on both sides; if the spine is deformed, the fringes lack symmetry. The simple procedure offers the advantages of early diagnosis at low cost, without the need for highly-skilled medical personnel. A permanent record of the subject is obtained immediately and can be used as a means for monitoring therapy effectiveness.

Otal Precision Co. Ltd. of Ottawa, aided by an NRC Program for Industry/Laboratory Projects grant, has produced three improved and more versatile devices from the original NRC prototype. The equipment will be distributed around Canada and the United States for more thorough testing and to assess its potential for international marketability. □

Sadiq Hasnain