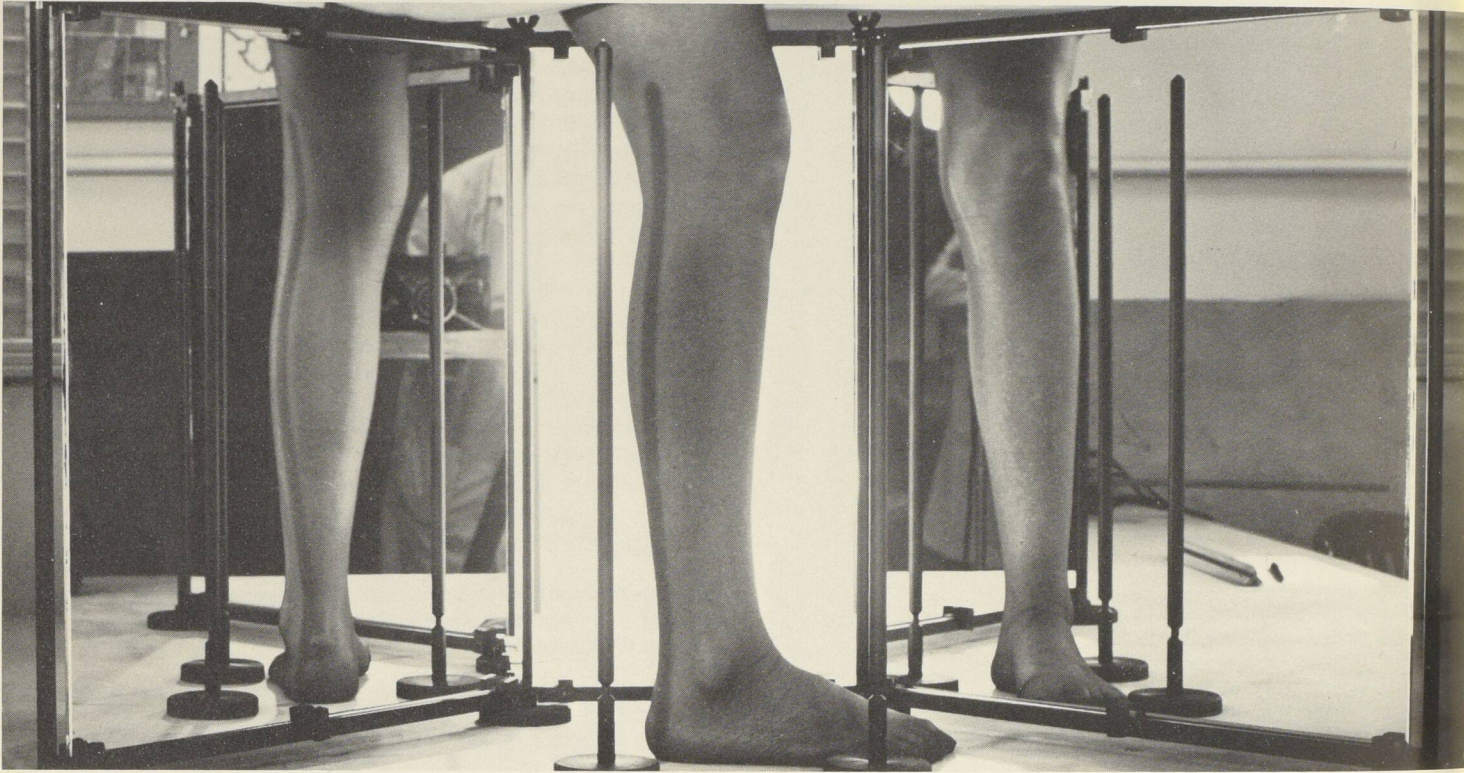


# photogrammetry

Simultaneous and complete view of a leg is obtained in orthopaedics with the use of two mirrors and a stereocamera. Three-dimensional, digital model reconstructed by analytical photogrammetry provides data for an automatic numerically controlled production of prostheses.

- Grâce à deux miroirs et à un appareil stéréoscopique on a pu réaliser, pour un orthopédiste, cette vue simultanée et complète d'une jambe. Un modèle numérique tridimensionnel construit à l'aide de la photogrammétrie analytique fournit les données nécessaires à la production automatique de prothèses par une machine à commandes numériques.



only of a number of positions, but also the angular and linear velocities. Knowledge of velocities and positions can contribute to determining the cause of an accident and aid in ruling out false hypotheses. This was the case in accident investigations carried out on several occasions by the Canadian Ministry of Transport, when film or photographs taken by chance provided vital data.

These are just a few examples how photogrammetry, conceived initially as a mapping and surveying technique, is becoming a universally accepted recording and measuring method of unique character and versatility. It is based on physics and mathematics and to its storehouse of tools belong photography (including X-ray), remote sensing media, optics, electronics and very special, fine mechanics.

In addition to the many basic theories and development of techniques which have pioneered new approaches in the field of mapping and surveying, several novel instrument concepts have originated in NRC's Photogrammetric Research Section, among them, a new concept in mapping based on so-called stereo-orthophotos which could revolutionize the approach to many conventional mapping problems. Even more significant is its application in the mapping and photo interpretation fields outside conventional cartography — agriculture, forestry, geology, environmental studies, geography, general planning, administration — which normally require large volumes of special maps and information to be ascertained from aerial photographs and for which conventional photogrammetric methods are often too complex; in contrast, the stereo-orthophoto approach is simple but precise. Because of its simplicity, experts in fields unfamiliar with the intricate photogrammetric technique can use it.

A few years ago, manufacturing of the NRC-Monocomparator was begun and it is being marketed throughout the world.

Two basic instruments for precise linear and angular measurements, Lincap and Circap, are other examples.

Recently, an agreement between Instronics Ltd. of Stittsville, Ontario and NRC's Division of Physics was announced whereby Instronics will begin to manufacture still another photogrammetric instrument called an Analytical Stereorestitutor, following the original concept invented and further developed by the Photogrammetric Research Section. It represents an advanced and efficient photogrammetric system of high performance surpassing existing analogue plotters. It is the only plotter that can handle all kinds of images produced by sophisticated systems used in airplanes or satellites and unconventional photogrammetric images used in fields other than mapping, in addition to the usual aerial photographs.

"Photogrammetry is rapidly becoming an indispensable, general measuring technique outside surveying and mapping and is on the threshold of further development offering exciting possibilities in scientific research with broad cultural, social and economic implications," says Dr. Blachut.

Manufacturing of photogrammetric instruments — some of them costing hundreds of thousands of dollars a unit — requires the mastering of complex and specialized technologies in fine mechanics, optics and electronics.

"We would like to hope," says Dr. Blachut, "that our work will eventually induce the domestic industry to become acquainted with these sophisticated technologies and help to establish manufacturing activities in new areas of opportunity. The initial difficulties are great and we are not lacking our moments of discouragement. However, some promising signs already mark the beginning of this new phase in our effort, and as the ancients used to say: The beginning is half the battle." □ Joan Powers Rickerd