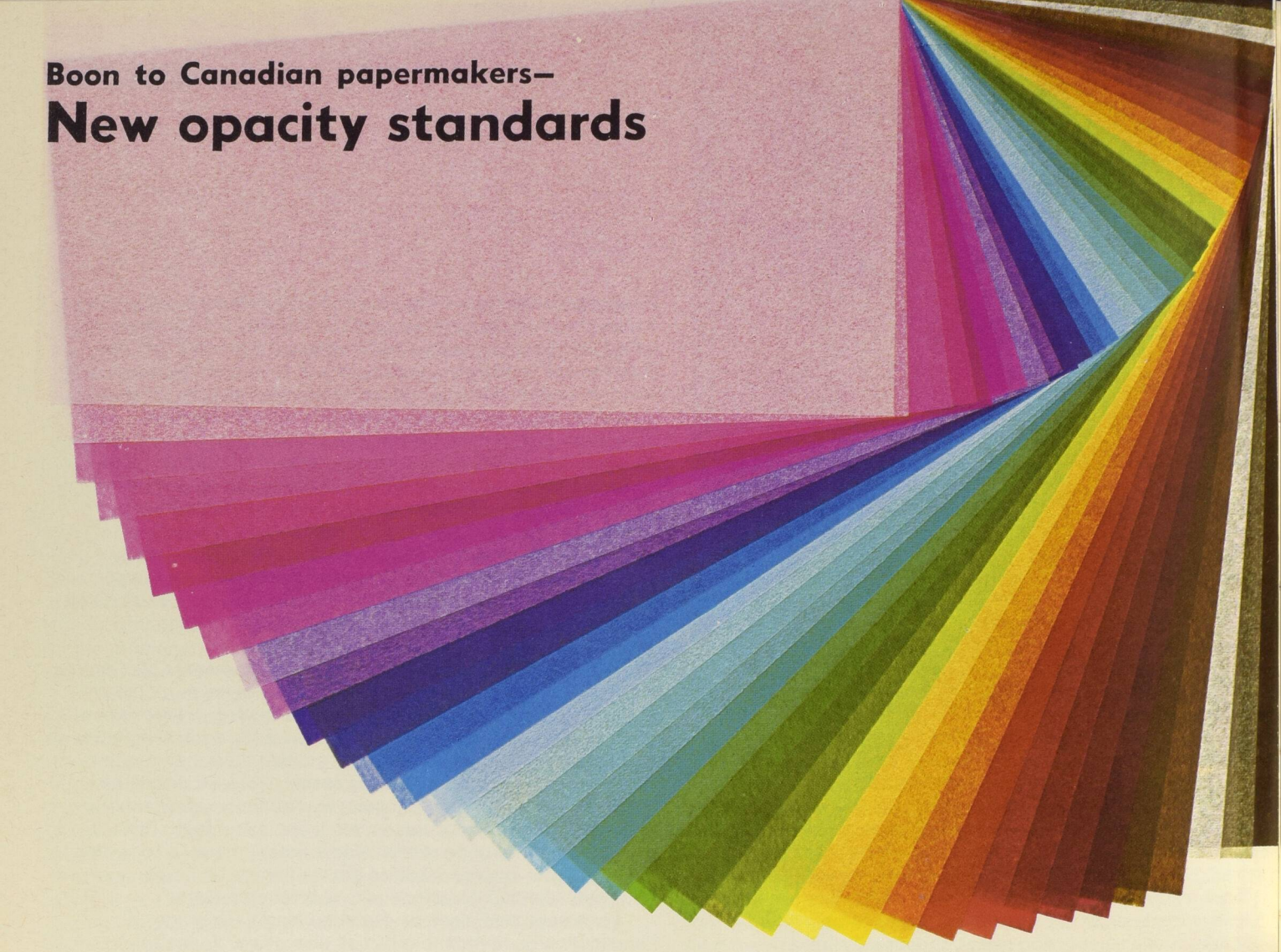
Boon to Canadian papermakers—

New opacity standards



Work conducted in the Division of Physics of the National Research Council of Canada towards the formulation of Canadian standards for paper opacity has proved to be of prime importance to paper manufacturers, printers, draftsmen and artists.

Opacity is closely related to paper's translucency. It is a quality which indicates how strongly words written or printed on one side of a piece of paper will be seen on the other. For example, tissue paper has a very low opacity, while newsprint and fine bond paper are of rather high opacity. Newsprint, which is printed on both sides, must possess high opacity since it must be hard to see through. Since no Canadian standards for the measurement of opacity have existed in the past, the Canadian paper industry has been forced to use those of other countries.

An instrument which has long been used for measuring opacity is the Elrepho electric reflectance photometer. It was believed that this instrument was accurate for measuring the opacity only of white or near-white paper, and that opacity measurements on colored paper were not feasible.

H.W. Budde of NRC's Division of Physics, is the only non-industrial member of the Optical Properties Subcommittee of the Physical and Chemical Standards Committee, Canadian Pulp and Paper Association which is now writing a standard for the measurement of opacity. He did not believe that opacity measurements on colored paper were impossible.

The Subcommittee had encountered problems when the matter of standardizing opacity measurements was considered. In most countries, opacity measurements were applicable only to white or near-white paper; little was then known about opacity of colored papers. So Mr. Budde undertook to find out.

His first difficulty consisted in finding suitable materials. Although some papermakers furnished samples of colored products, the colors tended to be soft, pastel shades and were of little use in extending the horizon of opacity measurements. He then obtained a set of brightly-colored tissue paper. Measurements on these sheets eventually were instrumental in the formulation of Canadian standards for opacity measurements and in the future will affect international standards.

These papers were of extremely low opacity which, coupled with the bright colors, indicated under normal test conditions that limits had been reached beyond which opacity measurements seemed to deteriorate. The brightly-colored set of papers was bordering the limit and provided the necessary data that colored papers of higher opacity and less bright colors could in fact be measured. Mr. Budde concluded that the restriction of opacity measurements to white and near-white paper was unnecessary.

"Within certain wide limits, opacity measurements on colored papers are quite feasible," he says.

The Elrepho instrument which played such an important role in this study is far from uncommon. Other instruments are also commercially available which can be used for opacity measurements. Hundreds are in use across Canada, helping both manufacturers of pulp and paper and consumers such as newspaper publishers and large printing firms. But the full capabilities of the Elrepho instrument were not known.

Mr. Budde's investigation was based on the comparison of opacity measurements in the Elrepho with those made in a recording spectrophotometer, which usually gives more accurate opacity values. The spectrophotometric process however is slow and too time-consuming to be feasible for an