"We knew that certain chemical groups in compounds were likely to be toxic to micro-organisms. We worked with the thiocarbonyl group. After making a large series of compounds, we found that we had arrived, by luck as much as good management, at one good set of compounds that are uniformly effective in preventing the destruction of cellulose by fungi.

"The bulk of this work was done two years ago. We had our fungicides and we needed to find out the best way to go about putting them onto fabric. To bridge the gap, we spent a full year testing various ways of applying these chemicals to fabrics.

"For patent purposes we made a search to determine if we were the first to synthesize these compounds. Someone else claimed to have made them in 1926 and published a paper to this effect. Thus we cannot patent the process for making the chemicals. We can, however, patent the use of them as fungicides and our methods for application," Dr. Wiles says.

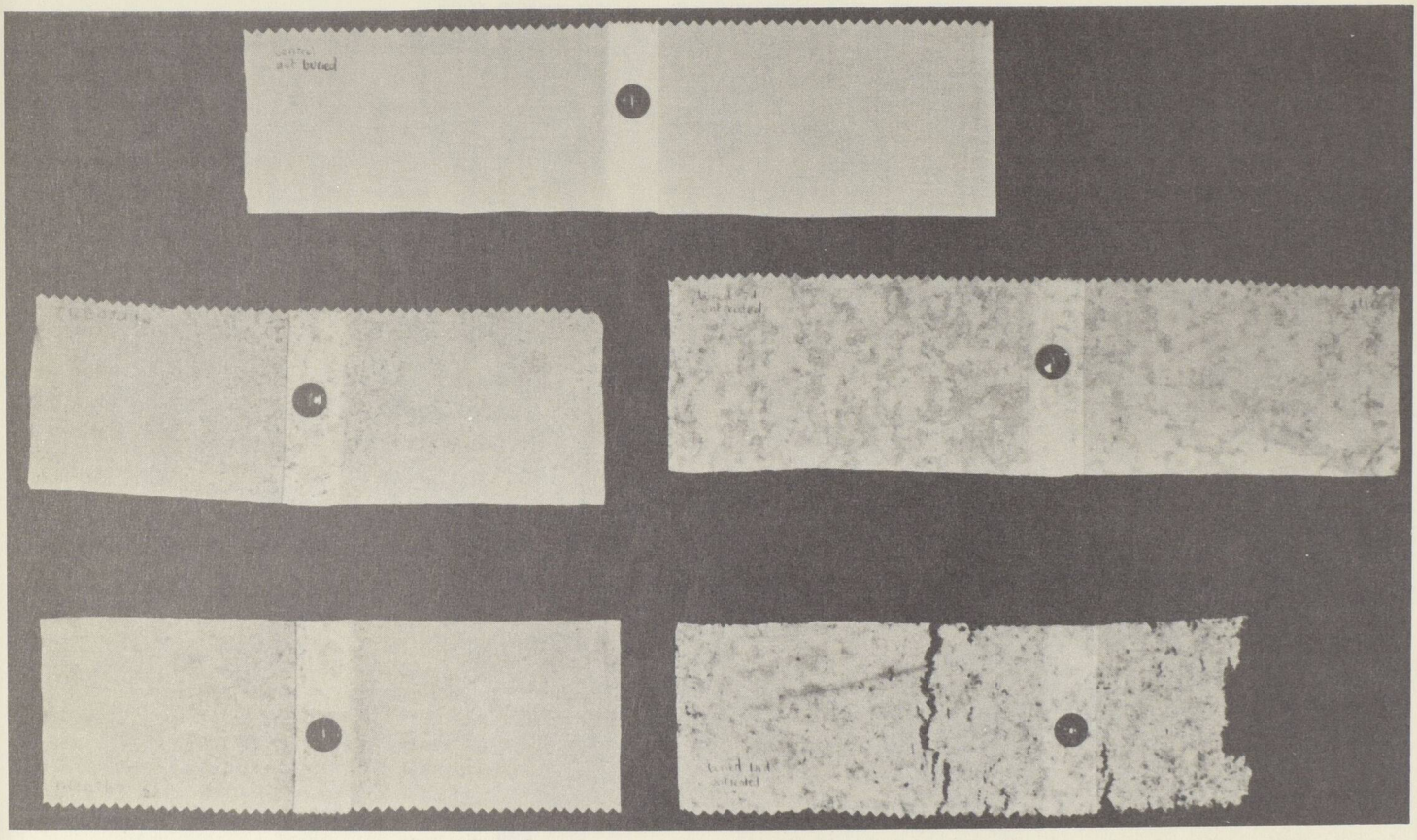
After small quantities of a series of thiocarbohydrazone compounds were synthesized, they were tested in three stages. Stage one was the tube-dilution test. Chemicals known to be good food for cellulose-destroying micro-organisms were placed in tubes. The fungicide was suspended or dissolved in the solution and a bit of the micro-organism was inoculated into the mixture.

"We found here that a concentration as low as 10 parts per million of every compound in the series wiped out the micro-organisms."

The second test involved the use of fabric. A small disc of fabric was treated with a fungicide. It was placed into a solid nutrient medium upon which the micro-organism would grow. Normally, with no fungicide, the growth of the micro-organism would soon cover the fabric and begin chewing it up.

"We found a low concentration of the fungicide would not only prevent growth of the organism over the fabric but also gave a no-growth zone around the disc itself," Dr. Wiles says.

The final and most conclusive test took place in the Textile Section's soil burial room. In a real man-made "hell-hole" with a temperature of 95 degrees and 100 per cent relative humidity, tests were made with fabrics in boxes containing microbiologically-active soil. The soil is made to recipes and is incredibly foul from a fungal and bacterial point of view. Seventy per cent of the breaking strength of untreated cotton duck (canvas) was lost after two week's burial in this soil. Canvas treated with the NRC fungicides lost virtually no breaking strength during the same period. □



Top – sample of tarantulle fabric. Left (middle row) treated sample after one week burial. Right – untreated sample after week's burial. Bottom (left) treated sample after two weeks burial. Right – untreated sample after two weeks burial.

En haut: échantillon-témoin de "Tarantulle", fine étoffe de coton. Au milieu: échantillons enterrés pendant une semaine; échantillon traité (à gauche) et non-traité (à droite). En bas: expérience similaire mais d'une durée de deux semaines.