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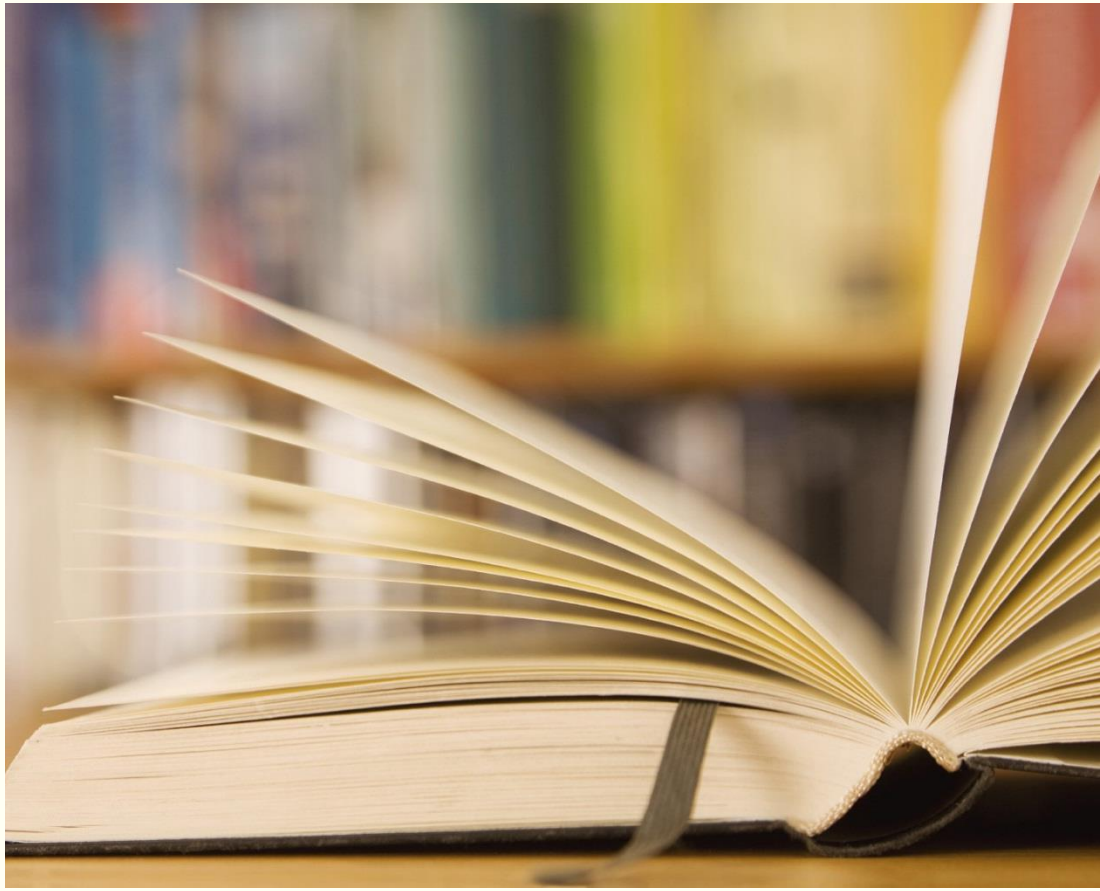

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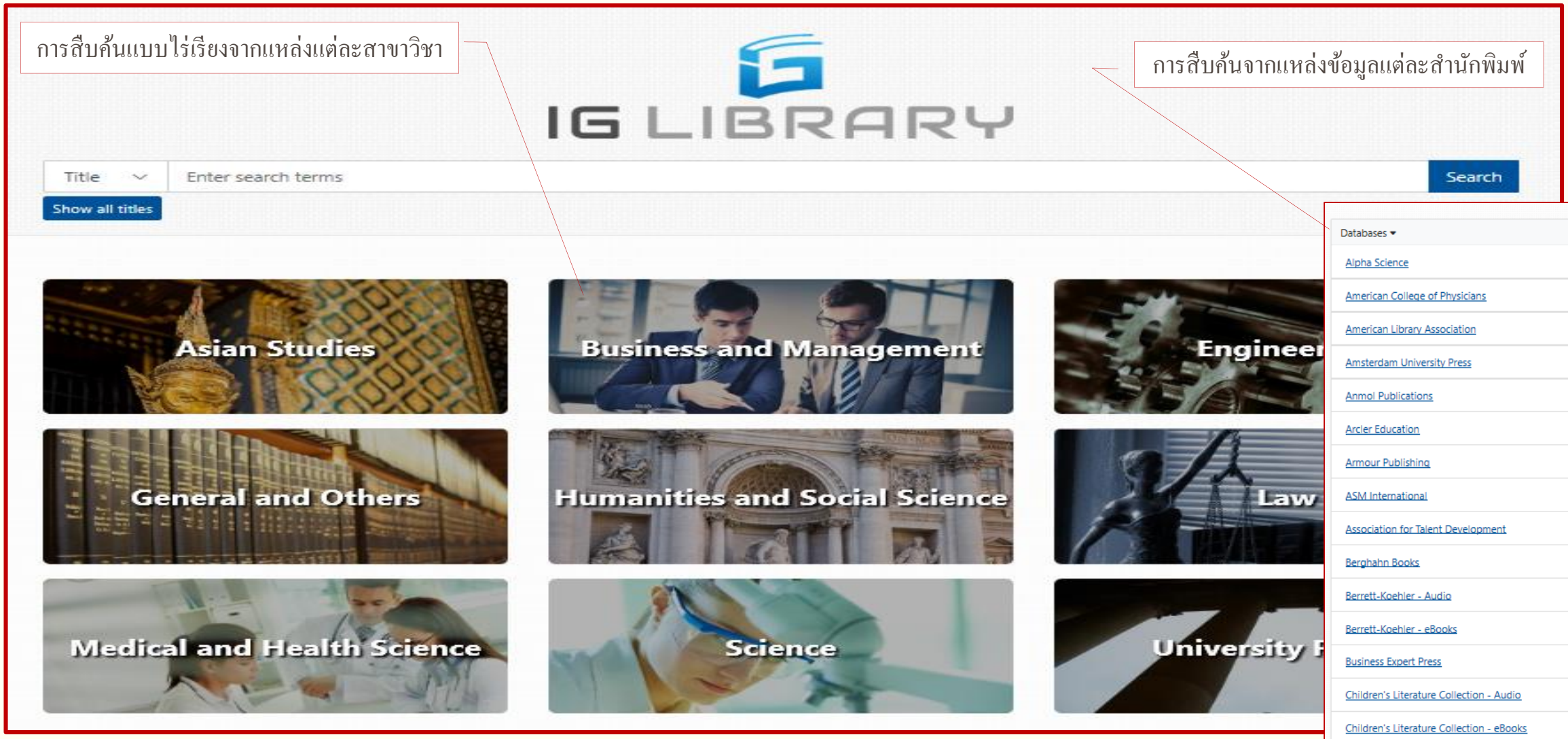

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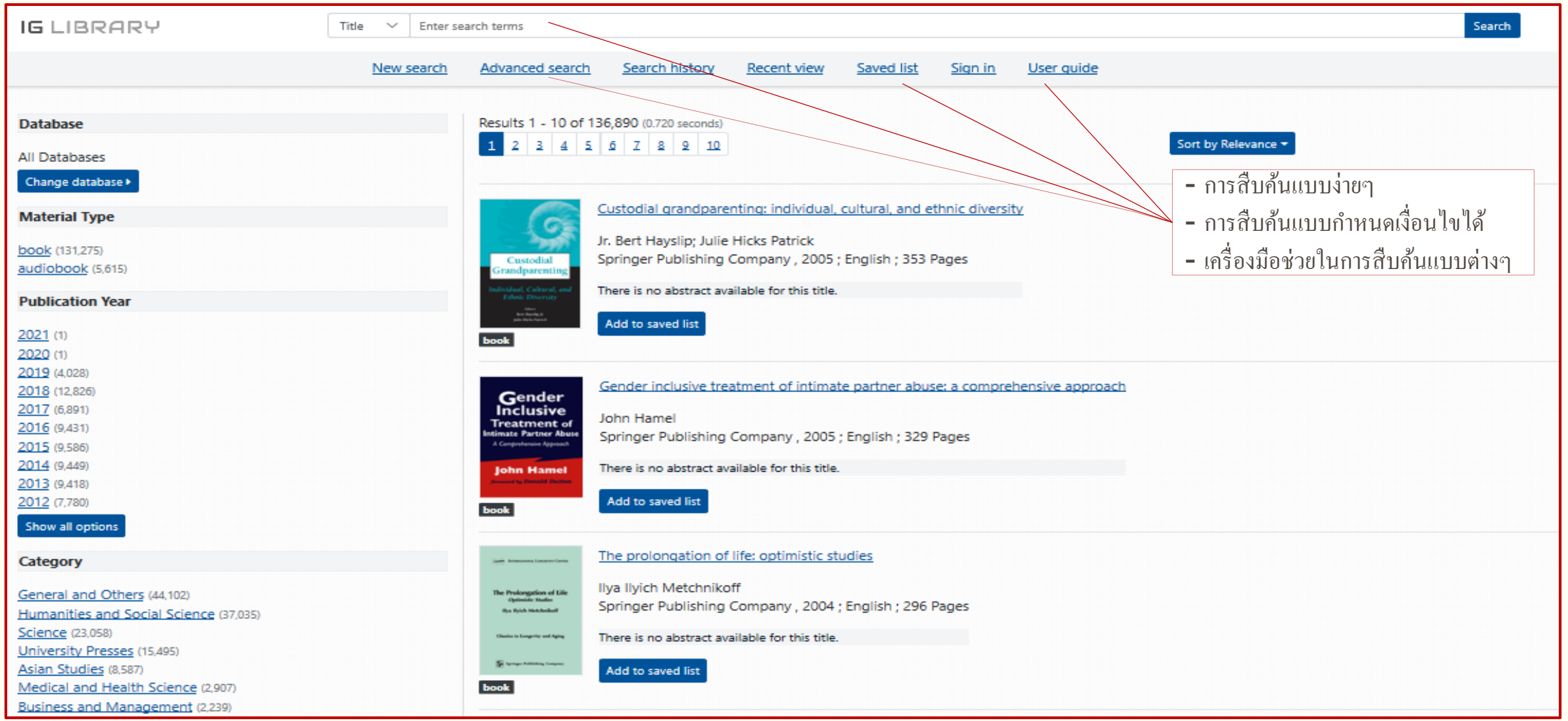

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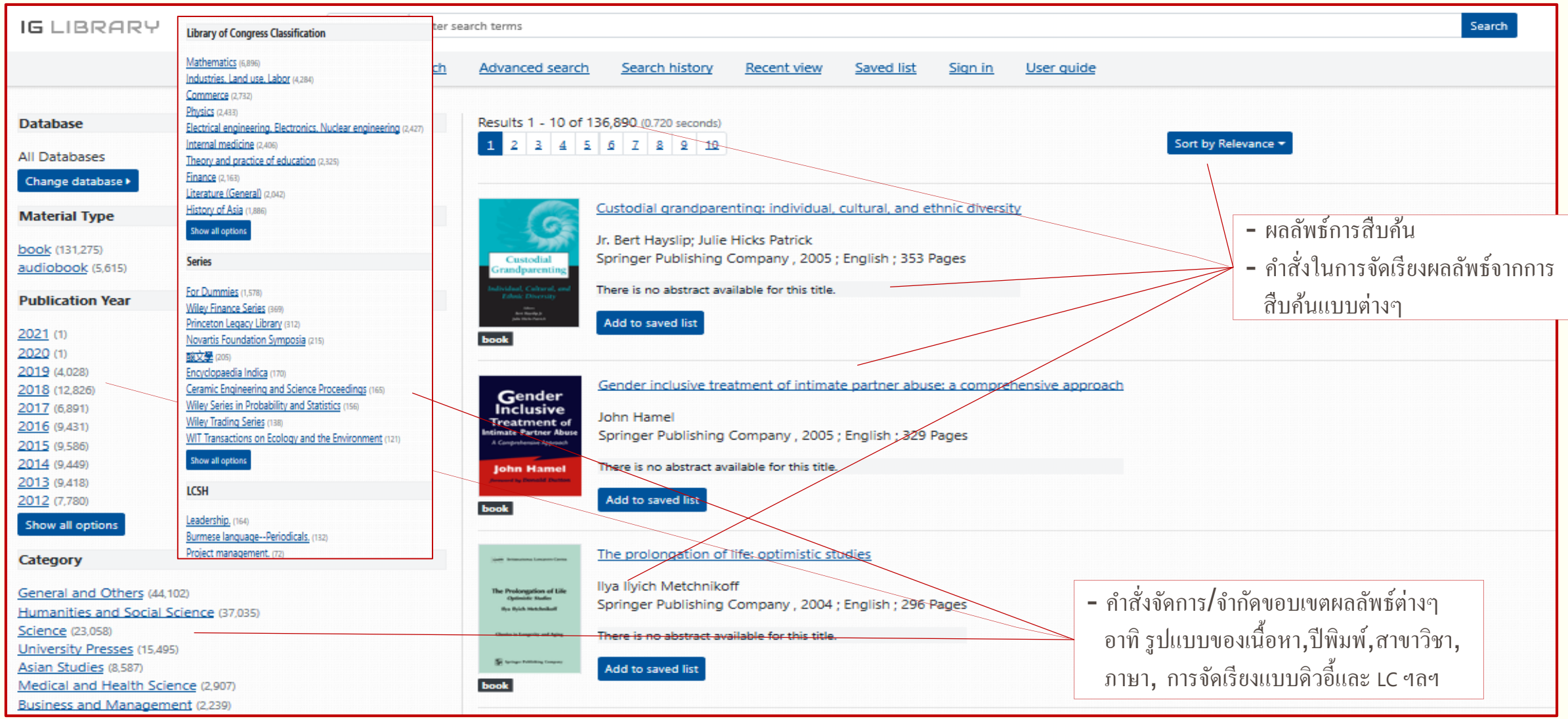

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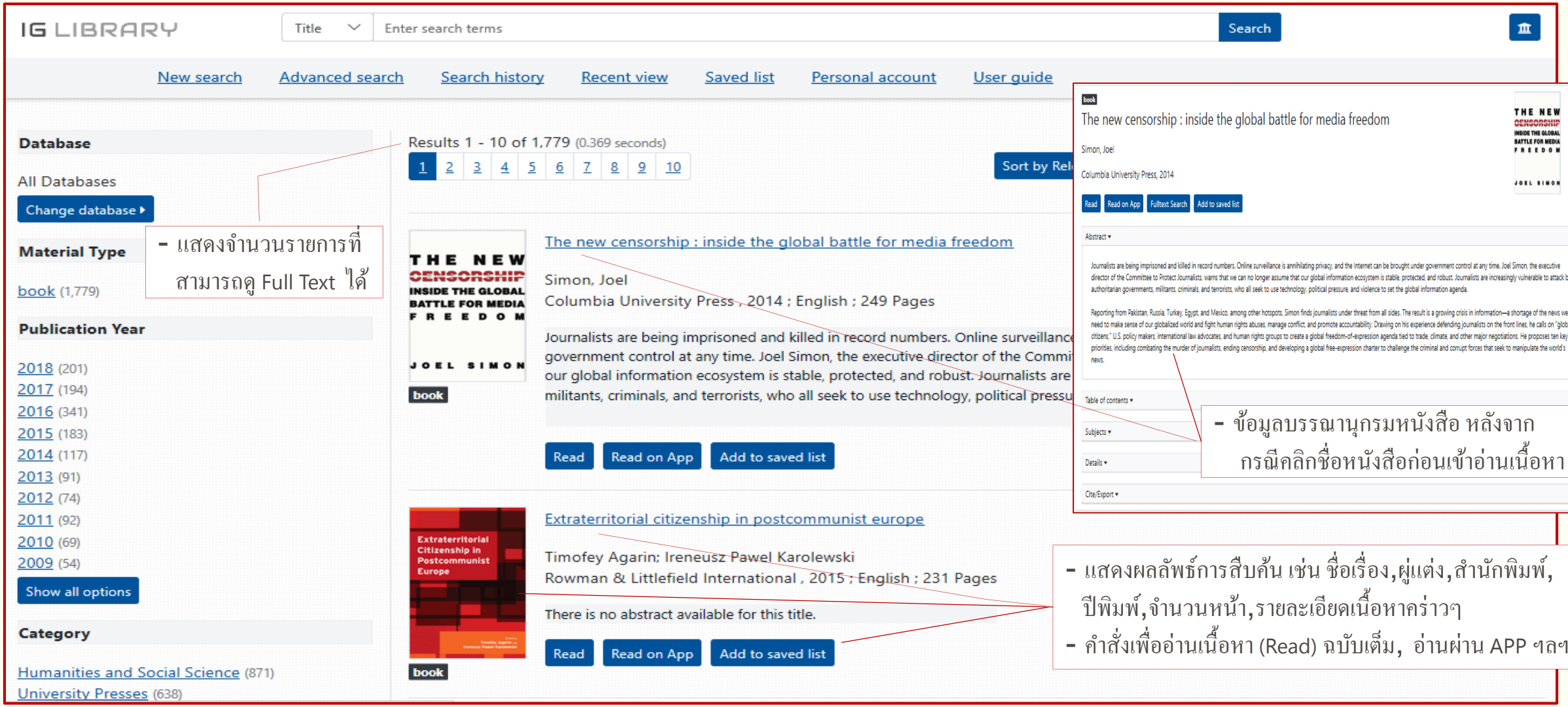

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Food biotechnolo...

Sutton, Mason; Barr, Skylar
ETP , 2018 ; English ; 334 Pages

Biotechnology has a long history of use in food production and processing. For ten thousand years fermentation, a form of biotechnology, has been used to produce wine, beer and bread. Selective breeding of animals such as horses and dogs has been going on for centuries. Selective breeding of essential foods such as rice, corn and wheat have created thousands of local varieties with improved yield compared to their wild ancestors. Wheat that is best for bread is different from wheat that is best for pasta. This was accomplished through conventional breeding over many years using traditional methods. However, such methods were often unpredictable and inefficient, resulting in undesirable traits passed along with desirable ones.

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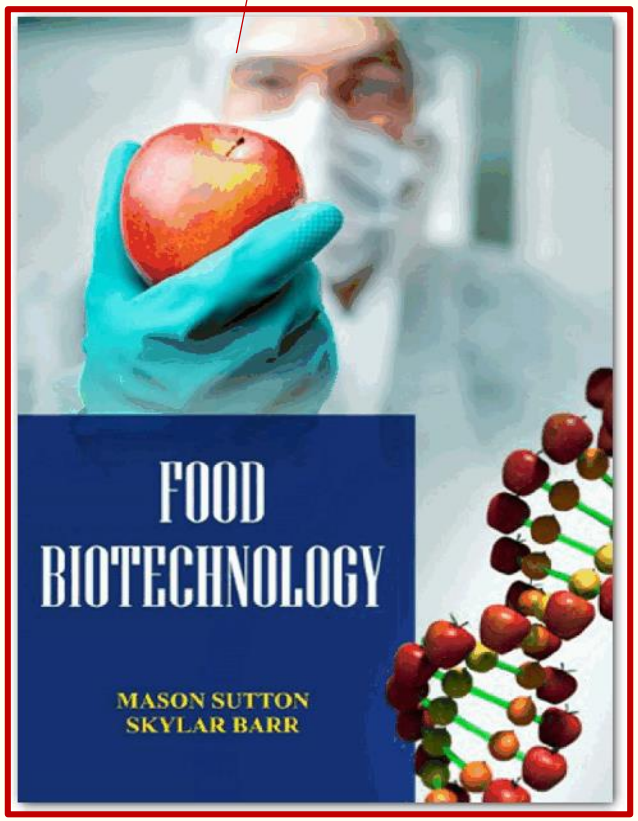

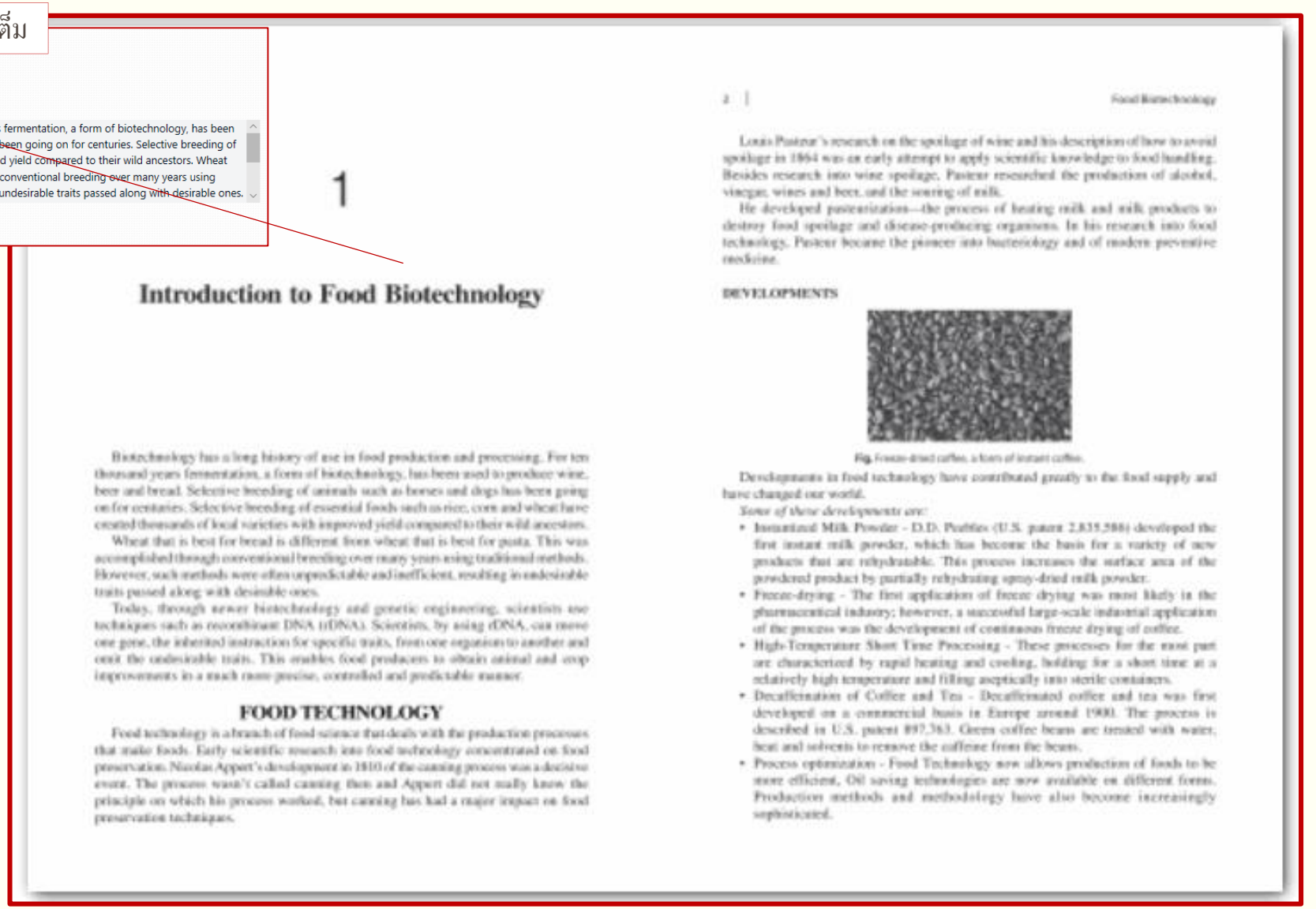

1

Introduction to Food Biotechnology

Biotechnology has a long history of use in food production and processing. For ten thousand years fermentation, a form of biotechnology, has been used to produce wine, beer and bread. Selective breeding of animals such as horses and dogs has been going on for centuries. Selective breeding of essential foods such as rice, corn and wheat have created thousands of local varieties with improved yield compared to their wild ancestors.

Wheat that is best for bread is different from wheat that is best for pasta. This was accomplished through conventional breeding over many years using traditional methods. However, such methods were often unpredictable and inefficient, resulting in undesirable traits passed along with desirable ones.

Today, through newer biotechnology and genetic engineering, scientists use techniques such as recombinant DNA (rDNA). Scientists, by using rDNA, can move one gene, the inherited instruction for specific traits, from one organism to another and omit the undesirable traits. This enables food producers to obtain animal and crop improvements in a much more precise, controlled and predictable manner.

FOOD TECHNOLOGY

Food technology is a branch of food science that deals with the production processes that make foods. Early scientific research into food technology concentrated on food preservation. Nicolas Appert's development in 1810 of the canning process was a decisive event. The process wasn't called canning then and Appert did not really know the principle on which his process worked, but canning has had a major impact on food preservation techniques.

2 | Food Biotechnology

Louis Pasteur's research on the spoilage of wine and his description of how to avoid spoilage in 1864 was an early attempt to apply scientific knowledge to food handling. Besides research into wine spoilage, Pasteur researched the production of alcohol, vinegar, wines and beer, and the souring of milk.

He developed pasteurization—the process of heating milk and milk products to destroy food spoilage and disease-producing organisms. In his research into food technology, Pasteur became the pioneer into bacteriology and of modern preventive medicine.

DEVELOPMENTS

Fig. Freeze-dried coffee, a form of instant coffee.

Developments in food technology have contributed greatly to the food supply and have changed our world.

Some of these developments are:

- Instantized Milk Powder - D.D. Peebles (U.S. patent 2,835,586) developed the first instant milk powder, which has become the basis for a variety of new products that are rehydratable. This process increases the surface area of the powdered product by partially rehydrating spray-dried milk powder.
- Freeze-drying - The first application of freeze drying was most likely in the pharmaceutical industry; however, a successful large-scale industrial application of the process was the development of continuous freeze drying of coffee.
- High-Temperature Short Time Processing - These processes for the most part are characterized by rapid heating and cooling, holding for a short time at a relatively high temperature and filling aseptically into sterile containers.
- Decaffeination of Coffee and Tea - Decaffeinated coffee and tea was first developed on a commercial basis in Europe around 1900. The process is described in U.S. patent 897,763. Green coffee beans are treated with water, heat and solvents to remove the caffeine from the beans.
- Process optimization - Food Technology now allows production of foods to be more efficient. Oil saving technologies are now available on different forms. Production methods and methodology have also become increasingly sophisticated.

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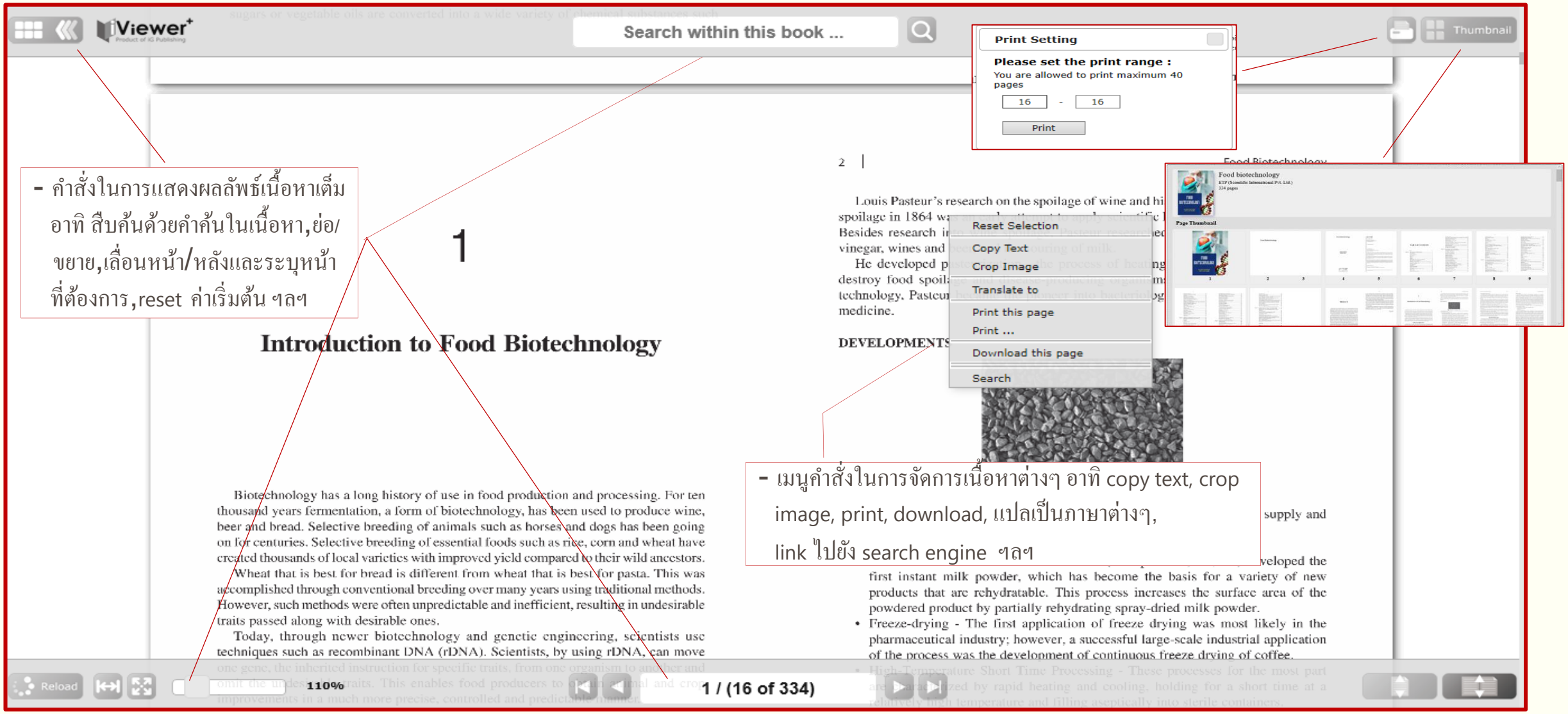

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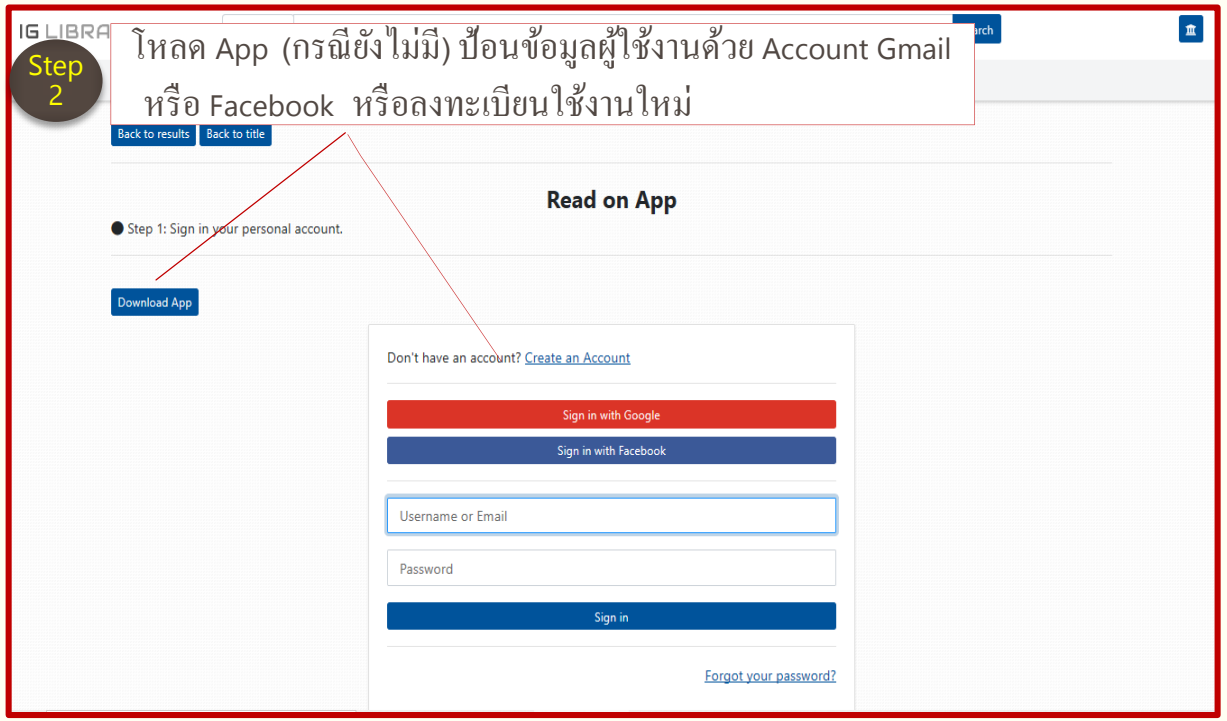

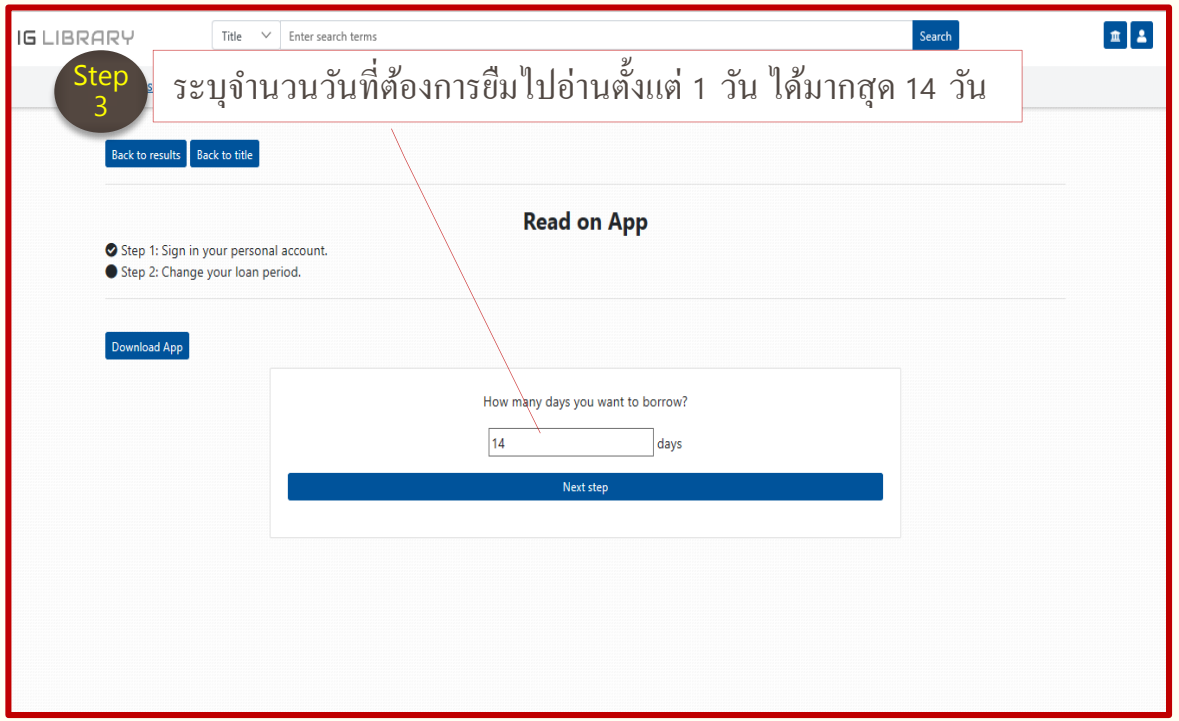

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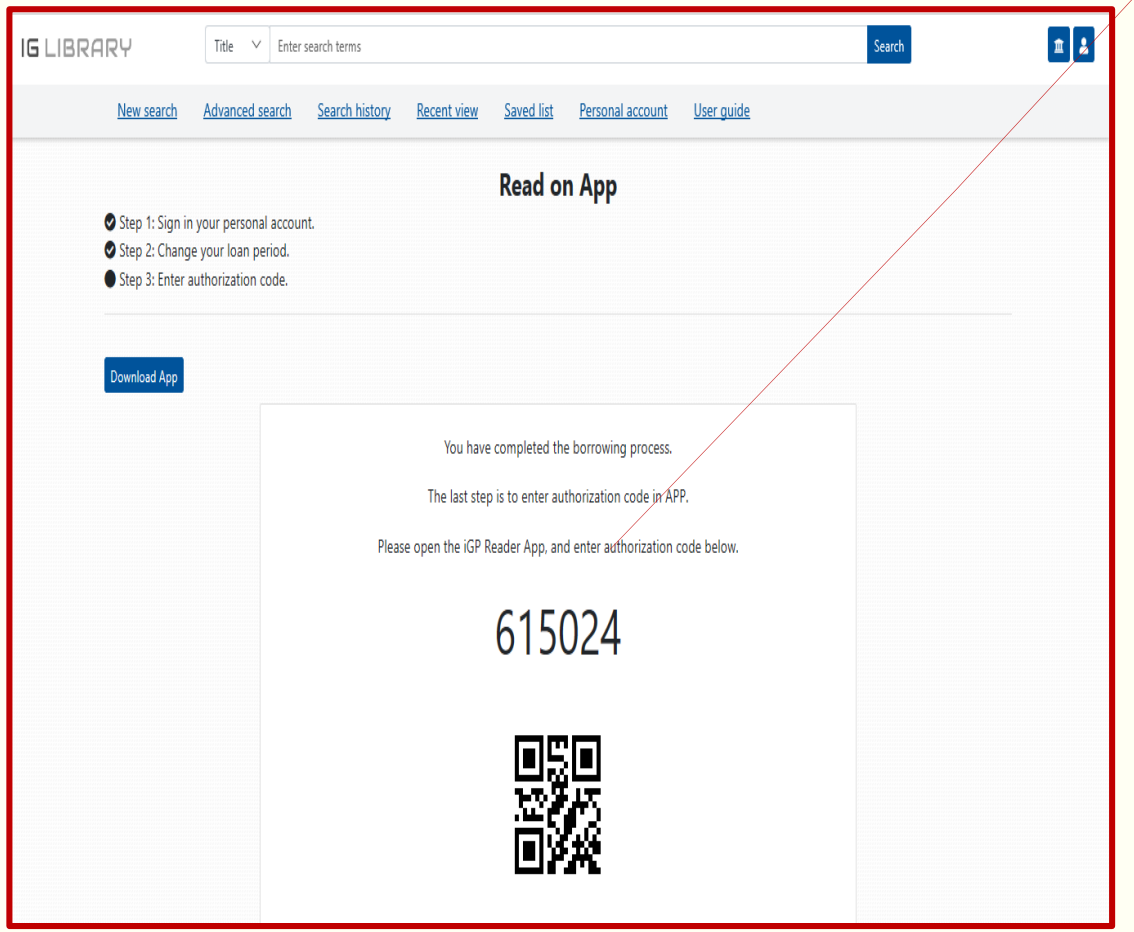

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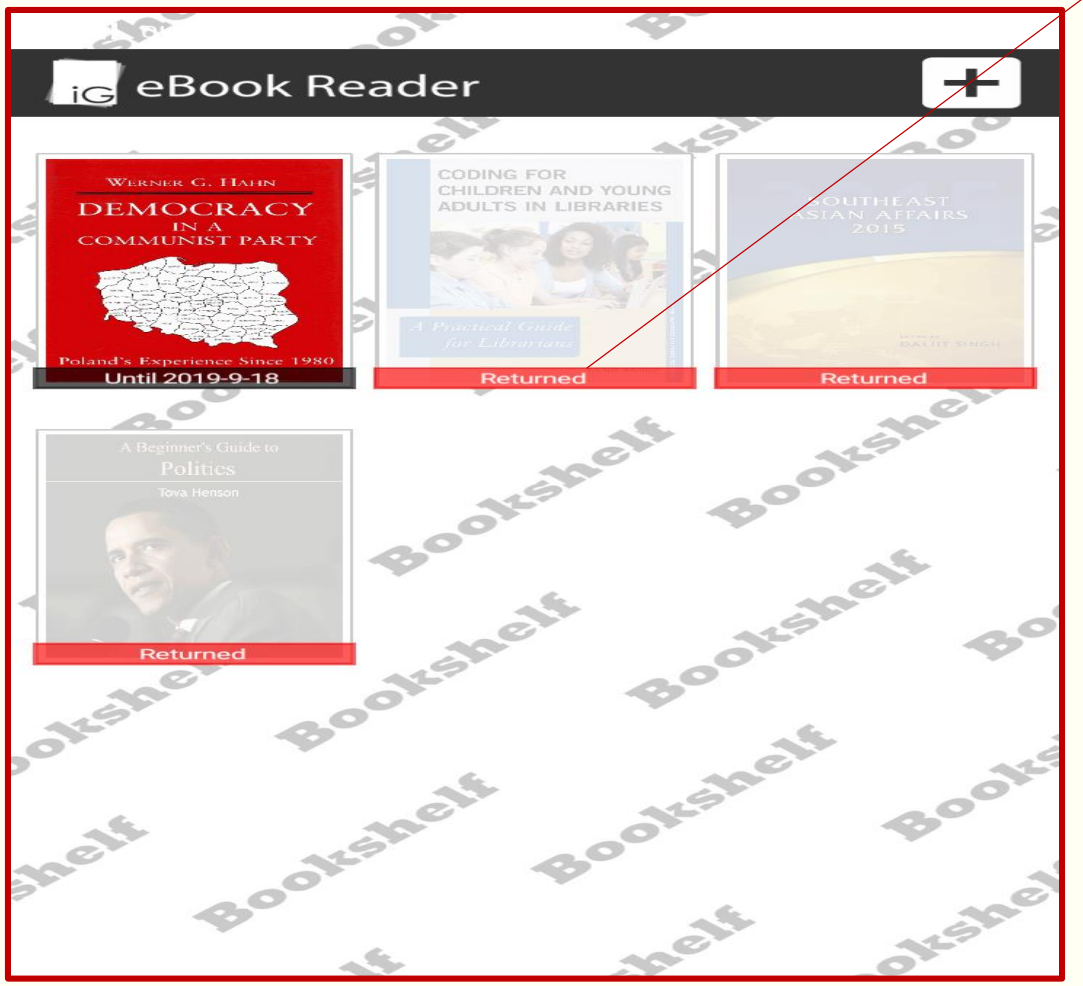

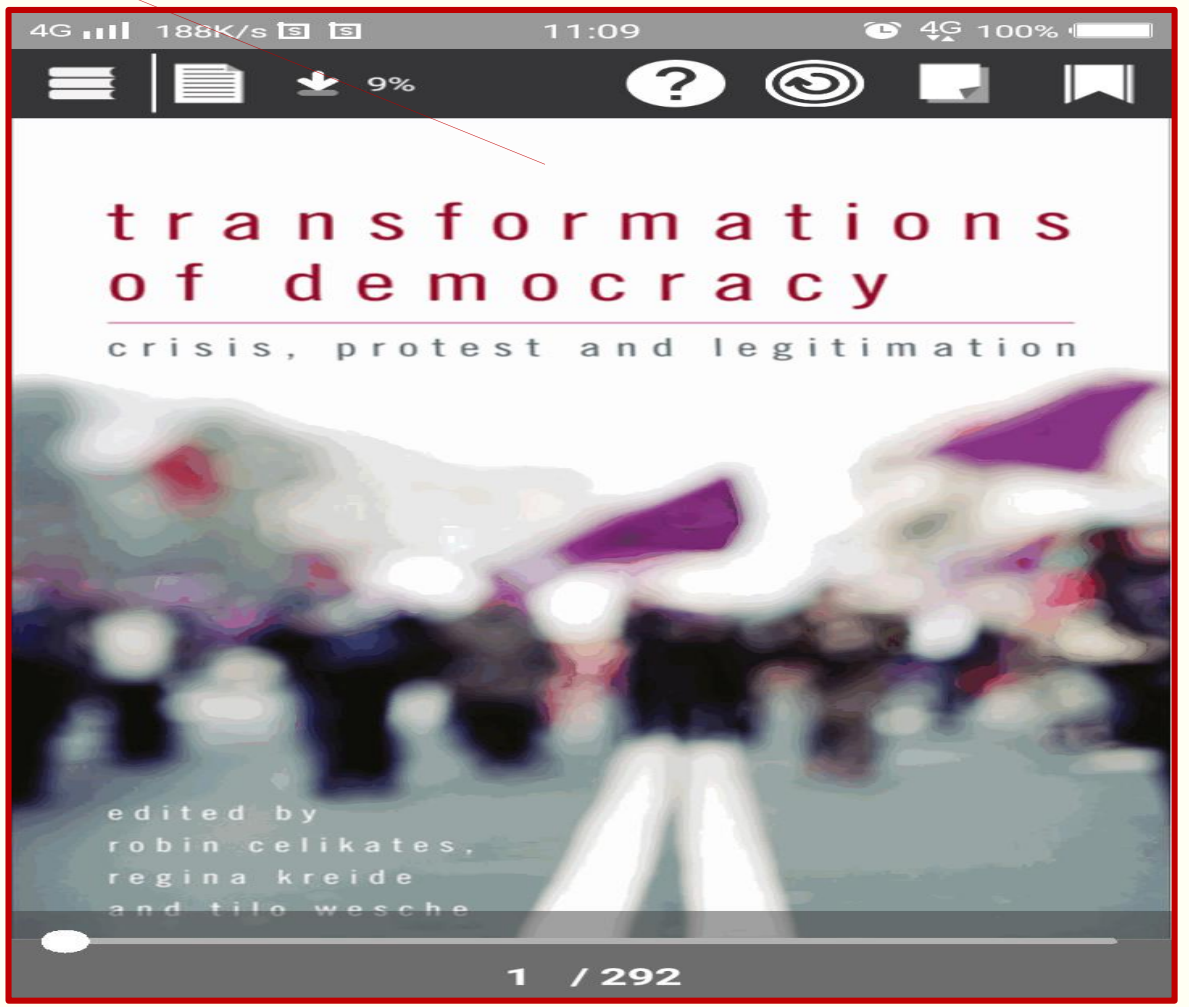

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