tion crisis but also a qualitatively new stage in the satisfaction of IN. Thus, it is not difficult to see that the information crisis manifested itself as a crisis of form, in this case the form of information storage. It should be emphasized that this crisis was overcome over the course of millennia. However, at that time any step on the road to progress took a long time. Even the stone age itself lasted eight thousand centuries.

After the appearance of the written document, humankind concentrated most of its information activity on improving this form. The following directions were pursued:

1. The creation of more convenient and durable material for the carrier of information.
2. The creation of instruments for applying text to the carrier.
3. The creation of pigments used for applying text.
4. The creation of methods of storage and use of documents.

We would like to point out that for the last millennium after its creation, writing itself did not undergo serious changes nor did it cause an information crisis. From time to time critical situations have arisen in each of the four directions listed. In the first direction, rock faces as the most ancient carriers of information were replaced by clay tablets, which, by the way, were not totally clay (the Sumerians added river silt to clay for strength and durability). Tablets were replaced by papyrus, then parchment appeared, and finally this was replaced by paper. Other, not so widespread, carriers of information also existed—bark strips, bone fragments, shells, and silk fabric, among others. However, the existence of various carriers did not always imply a solution to the problem connected with the existence of an information crisis. In several cases these were only alternatives in the search for material that would enable early society to overcome the crisis.

It is of interest to consider how the information crisis was connected with the material that was then being used to carry information. For example, in the 2nd century B.C., in the city of Pergamum, parchment began to be produced from cowhide. Rather quickly it became the basic material for carrying information in Europe. However, by the 12th century the need for information became so great (i.e., the number of users of accumulated information proved to be as large as the number of writers, including copyists who produced manuscript books) that the need for a new carrier became clear. By simply extrapolating the development of the available information situation into near future, people recognized that cattle would be insufficient for the production of parchment. In fact, for one average-size church book, almost a whole herd of cattle was needed. At the beginning of the 13th century, paper appeared in Europe. The low price of this material was remarkable in comparison with parchment.

It is known that paper first appeared in China in the 2nd century A.D., where it replaced silk. Chinese masters collected the bark of the mulberry tree,

separated fibers from the inner side of the bark, and then carefully compressed these fibers, finally forming white sheets. This was the ancestor, although a distant one, of modern paper. Paper was brought to Europe, already free of defects, by peoples of Central Asia, Arabs, and Byzantines. Its road was slow but unstoppable. Through Samarkand, paper reached Echmiadzin and Baghdad, then Cairo and Constantinople, and then Europe. Its appearance in Europe apparently served as one of the factors that helped to launch the beginning of the Renaissance.

Thus, the information crisis under consideration was a crisis of a specific type of material, a type that, at a specific point in time, could not in principle satisfy the growing information needs of society. Overcoming the crisis with the help of the transition from parchment to paper proved to be extremely successful, as proven by the fact that this carrier is being used successfully even today.

In the second of the indicated directions of information activity, means of writing on a specific carrier were created and developed. For example, on clay tablets, texts were applied by sharpened sticks; for writing on silk, brushes were used; on papyrus people wrote with reed pens. The number of readers was constantly growing, so to satisfy a reader's inquiry (IN), people began not only to write original texts, but also to copy what was already written. Thus, in the course of millennia not only authors were writing—the profession of copyists was born. Consequently, the development of methods and instruments of applying text to a carrier went in two directions—one that best served the authors of documents and another for the reproduction of what was written.

In spite of the fact that the method of writing for authors with the help of a writing instrument has been preserved up to our day (although alternative methods also appeared, for example, typewriters), crisis situations have arisen in each of the directions mentioned. The most well-known crisis affected the second direction. It arose precisely with the existence of a method of reproduction that would help the process of copying. In fact, if one computes by decades the growth of the number of manuscript books produced in the course of the first half of the 15th century, and then extrapolates this growth to the end of the 15th century, it would turn out that by the end of this century there would not be enough people in Europe to copy the books. However, the rate of growth in the number of copies of books not only did not decrease, but, on the contrary, it increased as in 1448 Gutenberg invented printing. In other words, the information crisis of the 15th century was a crisis of the traditional method of hand-copying of books, a method with a multicentury history. The new method allowed the crisis to be overcome.

Important crises also affected the first direction. For example, with the appearance of paper, there also appeared an instrument for writing, such as the goosequill. For hundreds of years the whole world wrote with goosequills. At the beginning of the 19th century, Russia alone sold to England 20 to 30 million goosequills annually (quite a number considering that one goose gave from 10