

Progress Made in Increasing Indiana's Human Resources

STEPHEN S. VISHER, Indiana University

A summary of the methods by which the value of Indiana's people has been increased is an interesting and appropriate although unusual subject for discussion before the Academy. Indiana's scientists have contributed significantly to this progress and can assist further by pointing out how the increase in value has been accomplished.

The total value of Indiana's 4½ million people is greater than 45 billion dollars, which is several times greater than the sale value of all of Indiana's land, buildings, roads, railways, parks, minerals, etc. The average value of a person has been calculated in two chief ways—the cost of rearing and educating him, and second, his probable future earnings capitalized, that is how much capital would need to be invested in order to yield the annual income that the person can reasonably be expected to yield.

Recent, careful studies have shown that the average cost of rearing and educating a Hoosier to age 20 now is fully \$15,000. However as a fifth of Indiana's present population are small children and a third were reared and educated when costs were considerably less than at present, the average of \$10,000 per person is used to obtain the total of 45 billion dollars mentioned.

Influence of Increase in Population

Many influences have combined to create this huge resource. First is the increase in population. Indiana contained fewer than 100,000 people when admitted as a state in 1816. The population increased to 1,000,000 in 1850, to 2,000,000 in 1880, to 3,000,000 in 1920, to 4,000,000 in 1950, and to 4.6 million in 1960. This increase was partly due to immigration from other states and countries but as more people have left Indiana than have come into it since 1850, the major cause of Indiana's increase in population has been the excess of births over deaths. Until about fifty years ago the average birthrate was relatively high and although the death rate was likewise high, it was progressively decreased by varied improvements, including better water supplies, better food, greatly increased medical care, including vaccination, inoculation, "wonder drugs," etc. While a century ago more than half of the children died while young, before they could contribute much, recently healthy infants have excellent prospects of living about 70 years. Thus the average length of serviceable life has been greatly increased.

Influence of Increased Use of Tools and Power

The amount of wealth which the people of Indiana produced in their lifetime has increased greatly. During the earlier decades of Indiana's history most of their work was heavy manual labor, much of it with an ax, as they cut down trees with which to build log cabins, cleared a patch of land for crops, and made crude rail fences. Even saws and plows were rare in Indiana before 1840, and there were few oxen or horses for several decades. In those early years the people of Indiana made their chief contribution to the state's wealth by "hewing homes out of the wilderness" and by rearing children.

Gradually there was an increasing use of tools of ever greater effectiveness, and of power from oxen, horses, and tiny waterfalls in the earlier decades, and later from steam and petroleum. In recent years most Indiana farmers used much equipment—an average of more than \$5,000 worth per farm, and a great deal of power, much of it from petroleum but considerable from electricity made with coal. The factory worker formerly had little equipment or power but now has equipment, in most factories, costing several thousand dollars per worker. In many large Indiana factories the equipment used (including the buildings and accessories) costs tens of thousands of dollars per worker, enabling him to produce very much more than an equally able worker could produce only a few years ago.

The Influence of Increased Education

In addition to increase in the number of workers, in their tools and equipment with which they work, and in the amount of help which they obtain from power produced from minerals, the wealth production of Indiana's people has been greatly increased by education.

Increasing the productivity of Indiana's people by improving their education has been accomplished with the help of many people, including parents, neighbors, teachers at each of the levels, clergymen, public officials, newspapers, magazines, and recently by radio and television. Many people not living in Indiana have contributed, people from many foreign lands and of many centuries.

The amount and quality of education in Indiana has increased enormously. While a century ago only a tiny fraction of the people had more than a few months of formal schooling, and there were in the state only a few dozen college graduates, the situation had changed greatly by 1900 when Indiana had hundreds of high schools and more than 50 colleges. Recently a large share of the young adults have graduated from high school and some hundreds of thousands have attended college. In 1960, for example, the various Indiana universities and colleges graduated about 10,000 people, conferring upon several hundred, doctor's degrees, including doctors of medicine, dentistry, education, and "philosophy."

Now people from all of the states and from many foreign countries come to Indiana for part of their advanced education because of the excellence of our offerings. For example, Purdue University, one of the nation's largest engineering schools, attracts many prospective engineers; Indiana University attracts many future physicians, lawyers, and businessmen; Purdue, Indiana University, Notre Dame, the two state teachers colleges and other colleges attract many prospective teachers, as well as people who attend college for other reasons, including the improved opportunities available there to make valuable friendships.

While a century ago, Indiana's schools trained chiefly in reading, writing and arithmetic, now the educational offerings are much more varied. This has been made possible by the expansion of the elementary schools, by a great increase in the number of high schools, and by the enrichment of the offerings. An example as to colleges may be given. Prior to 1890 most college students were preparing to be clergymen or lawyers and much time was spent in the study of Greek, Latin, and the Bible. When the great expansion occurred in elementary and high schools,

a large share of the college students prepared themselves to become teachers. Some forty years ago the rapid growth of cities and industries in Indiana stimulated many college students to prepare for careers in business. Recently only a tiny fraction of Indiana's college graduates become clergymen and less than a fifth become teachers, while roughly a third go into some phase of business.

The educational requirements for success in most fields have risen sharply; for example, in 1900 persons who had not completed high school could teach, practice law, medicine, or engineering. Now college graduation is almost required for new teachers and relatively thorough training is required before lawyers, doctors, dentists, or engineers are permitted to earn a living from their profession.

Increased Work Opportunities

In the early decades of Indiana's history there were only a few ways in which people could make a living. The chief way was by farming. Few clergymen, teachers, or lawyers could earn a living by preaching, teaching, or practicing law, and only a few persons were fully supported by a business.

As no two people are alike in their interests and aptitudes, as the number of work opportunities have increased and the opportunities to prepare for them, the work output of Hoosiers has increased. Now in Indiana there are many thousand different ways of making a living. Even farming has been diversified into more than a score of types each of which appeals to somewhat different types of people. Similarly there are many different teaching positions and thousands of different jobs in the business world.

Increasing the education and work opportunities of Hoosiers has been greatly facilitated by wise counseling. A variety of tests have been developed, especially during the last 50 years, which reveal many of the young person's interests, attitudes, and aptitudes. These tests, being improved year by year by specialists, have in recent years been much used to assist young people. It is highly desirable for each person to discover early what they can do exceptionally well, with pleasure, and to prepare themselves to do it. A major source of satisfaction is doing something well. Conversely, much unhappiness comes from work which is not enjoyed, because it is not done well as a result of lack of interest, aptitude, or training.

The facts that in Indiana there have been increased opportunities for young people to learn what he or she can do well, greatly enriched and extended training (with the help of scholarships and other aid to students), increased leadership, and greater work opportunities have all notably augmented the productivity of our people, and hence their value.

Influences of Increased Use of Natural Resources

In the early decades of Indiana's history, almost no use was made of Indiana's resources other than those of soil, forest, game, and water, and only slight use was made of them. Decades passed before it was learned how to use each of the varied soils to good advantage. Counteracting the excessive acidity, which is normal in forest soils, by the addition of pulverized limestone, and enriching them with appropriate fertilizer has

largely been learned only recently. Reduction of the loss of the precious topsoil by erosion has largely occurred only since the establishment of soil conservation districts in 1937. (Much remains to be done on this line.)

Indiana's wonderful resource of forests unfortunately has been used mostly wastefully. Indeed in obtaining more cropland, many, even choice, trees were burned. Lumbering first was done extensively after railways came in the 1850s. By 1930 few good log trees remained.

Coal, which underlies about an eighth of the state, was first used in considerable amounts shortly after the Civil War. Petroleum and natural gas began to be used shortly before 1890. Indiana's choice building limestone was little used until the 1890s, and little gravel and crushed limestone were used before 1900. The large amount of land which was often too wet was considered to have almost no value for decades. The laborious draining of parts of the wetland commenced in the 1870s. Much of about one-eighth of the state which formerly was "wetland" has recently become almost the best farm land in the state and some of the best in the nation.

Indiana's water resources greatly increased in value as the population grew. The lakes of northern Indiana had very little value prior to about 1910, but now are so valuable that it is illegal to drain a natural lake. Many artificial lakes and ponds have been created. Lake Michigan's value to Indiana greatly increased when the steel mills of Gary were established in 1906. Indiana's underground water resource, exceptionally bountiful in most places, was slightly used for decades, but recently has been highly valuable.

Indiana's total productivity was increased also as additional minerals were discovered and used. An example is clay suitable for the making of brick and tile and "fire clay," which is used for the making of special tile and heat-resisting brick. Another example is the use of stone especially suitable for making cement and another stone useful for the manufacture of "rock wool" used for insulation. A hard limestone especially suited for making crushed rock for roads and concrete has become in recent years highly valuable. The pulverized limestone by-product of crushing has been extensively used to sweeten the soil and increase crop yields and grass growth. The latest great mineral resource to be discovered and used in Indiana is gypsum, recently extensively mined near Shoals, Indiana.

Each of these increased uses of natural resources also increased work-opportunities for people and hence the value of the human resource.

Influences of Introductions

The productivity of the people of Indiana has been greatly increased by the introduction into the state of new plants, animals, and people. None of the crops now important in Indiana are native here. The chief crops, hybrid corn, soybeans, wheat, oats, and tomatoes, and grasses and legumes used for pasture and hay were introduced mostly from Europe and Asia. However, hybrid corn and the varieties of wheat, oats, and soybeans now grown were developed in the U. S. from forms which had been introduced. The same is true of the fruits, melons, potatoes, and nearly all other crops grown.

Similarly the several kinds of domestic animals now important in Indiana were introduced mostly from Europe. Varieties of these have

been developed in the U. S. but none in Indiana. However, Purdue scientists made a notable contribution in increasing egg production by hens.

Although, as already remarked, more people have left Indiana than came into the state, the contributions of some of those who entered the state were very important. For example the Quakers and Scotch Presbyterians who came from the South during pre-Civil War years proved highly valuable educationally, as did some of those from New England or of Yankee ancestry from New York and Ohio. Some of those who came direct from Europe, notably Germany, contributed greatly too. Indeed a sizable percentage of the present huge value of Indiana's human resource reflects the influence of immigrants.

Summary and Conclusions

Indiana's human resources, now having a total value in excess of 45 billion dollars, a sum greater than the value of all Indiana's material resources, have grown in value as a result of many influences. A listing of some of these, here done, augments our appreciation of them. Progress is continuing, but much remains to be done, especially in reducing deaths from accidents, in making better use of women, of elderly people, and of handicapped people, and by increasing the usefulness of persons who possess more than average ability. All members of the Indiana Academy of Science can assist in some aspects of this worthy project.