

## CHAPTER 5 — KNOWLEDGE AND SKILL

In contrasting man in the civilized state with man in his primitive state I have dwelt most on the gain in the power of gratifying material desires, because such gains are the most obvious. Yet as thoughts precede action, the essential gain which these indicate must be in knowledge. That the ocean steamship takes the place of the hollow log, the great modern building of the rude hut, shows a larger knowledge utilized in such constructions.

To consider the nature of this gain in knowledge is to see that it is not due to improvement in the individual power of knowing, but to the larger and wider cooperation of individual powers; to the growth of that body of knowledge which is a part, or rather, perhaps, an aspect of the social integration I have called the body economic. If we could separate the individuals whose knowledge, correlated and combined, is expressed in the ocean steamship or great modern building, it is doubtful if their separate knowledge would suffice for more than the constructions and tools of the savage.

The knowledge that comes closest to the individual is what we call skill. Whoever, in mature years, has learned to do some new thing, as for instance to ride a bicycle, knows how slowly and painfully such knowledge is acquired. At first each leg and foot, each arm and hand, seems to need separate direction, which the conscious mind cannot give so quickly and in such order as to prevent the learner from running into what he would avoid. But as the effort is continued, the knowledge of how to direct these muscles passes from the domain of the conscious to that of the subconscious mind, and the needed correction takes place automatically. With continued effort, the knowledge required for the proper movement of the muscles becomes so fully stored in the

subconscious memory that at length the learner may ride easily, indulging in other trains of thought and noticing persons and scenery. His hard-gotten knowledge has passed into skill.

Now, because skill is that part of knowledge which comes closest to the individual, becoming as it were a part of his being, it is the knowledge which is longest retained, and is also that which cannot be communicated from one to another, or so communicated only in very small degree. You may give a man general directions as to how to ride a bicycle or operate a typewriter, but he can get the skill necessary to do either only by practice.

As to this part of knowledge at least, it is clear that the advances of civilization do not imply any gain in the power of the individual to acquire knowledge. Not only do antiquities show that in the arts then cultivated the men of thousands of years ago were as skillful as the man of today, but we see the same thing in our contact with people whom we deem the veriest savages. The Australian black fellow will throw a boomerang in a way that excites the wonder of the civilized man. On the other hand, the European with sufficient practice will learn to handle the boomerang or practice any of the other arts of the savages as skillfully as they, and wild tribes to whom the horse and firearms are first introduced by Europeans become excellent riders and most expert marksmen.

It is not in skill, but in the knowledge which can be communicated from one to another, that the civilized man shows his superiority to the savage. This knowledge, since it is not concerned with the government of the organs directly responsive to the conscious will, does not come as close to the individual as skill, but is held rather as a possession of the organ of conscious memory, then as a part of the individual himself.

Now, this is the knowledge which constitutes the body of

knowledge that so vastly increases with the progress of civilization. It is transferable by speech; and it becomes capable of more permanent storage and of wider and easier transferability — manuscripts, books, and so on.

This ability to store and transmit knowledge in other and better ways than in the individual memory and in individual speech, which comes with the integration of individual man in the social body or body economic, is of itself an enormous gain in the advance of the sum of knowledge. But the gain in other and allied directions that comes from the larger and closer integration of individuals in the social man is greater still. Of all the systematized knowledges, that which we call astronomy was probably one of the earliest. Consider the first star-gazers, who with no instrument of observation but the naked eye, and no means of record save the memory, sought by watching night after night related movements in heavenly bodies. How little even of their own ability to gather and store knowledge could they apply to the getting of such knowledge. For until civilization had passed its first stages, the knowledge and skill required to satisfy their own material needs must have very seriously lessened the energy that could be applied to the gaining of any other knowledge.

Compare with such an observer of the stars, the stargazer who watches now in one of the great modern observatories. Consider the long vistas of knowledge and skill, of experiment and meditation and effort, that are involved in the existence of the building itself, with its mechanical devices; in the great lenses; in the ponderous tube so easily adjusted; and the delicate instruments for measuring time and space and temperature; in the tables of logarithms and mechanical means for affecting calculations; in the lists of recorded observations and celestial atlases that may be consulted; in the means of communicating by telegraph and

telephone with other observers in other places, that now characterize a well-appointed observatory, and in the means and appliances for securing the comfort and freedom from distraction of the observer himself! To consider all these is to begin to realize how much the cooperation of other men contributes to the work of even such a specialized individual as he who watches the stars.