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https://www.100test.com/kao_ti2020/255/2021_2022__E5_A4_A7_E5_AD_A6_E8_8B_B1_E8_c67_255150.htm TEXTAs the author points out below, the success of science has less to do with a particular method than with an essential attitude of the scientist. This attitude is essentially one of inquiry, experimentation and humility before the facts. Therefore, a good scientist is an honest one. True scientists do not bow to any authority but they are ever ready to modify or even abandon their ideas if adequate evidence is found contradicting them. Scientists, they do place a high value on honesty.Science and the Scientific Attitudeby Paul G. HewittScience is the body of knowledge about nature that represents the collective efforts, insights, findings, and wisdom of the human race. Science is not something new but had its beginnings before recorded history when humans first discovered reoccurring relationships around them. Through careful observations of these relationships, they began to know nature and, because of natures dependability, found they could make predictions to enable some control over their surroundings.Science made its greatest headway in the sixteenth century when people began asking answerable questions about nature -- when they began replacing superstition by a systematic search for order -- when experiment in addition to logic was used to test ideas. Where people once tried to influence natural events with magic and supernatural forces, they now had science to guide them. Advance was slow, however, because of the powerful opposition to

scientific methods and ideas. In about 1510 Copernicus suggested that the sun was stationary and that the earth revolved about the sun. He refuted the idea that the earth was the center of the universe. After years of hesitation, he published his findings but died before his book was circulated. His book was considered heretical and dangerous and was banned by the Church for 200 years. A century after Copernicus, the mathematician Bruno was burned at the stake -- largely for supporting Copernicus, suggesting the sun to be a star, and suggesting that space was infinite. Galileo was imprisoned for popularizing the Copernican theory and for his other contributions to scientific thought. Yet a couple of centuries later, Copernican advocates seemed harmless. This happens age after age. In the early 1800s geologists met with violent condemnation because they differed with the Genesis account of creation. Later in the same century, geology was safe, but theories of evolution were condemned and the teaching of them forbidden. This most likely continues. "At every crossway on the road that leads to the future, each progressive spirit is opposed by a thousand men appointed to guard the past." Every age has one or more groups of intellectual rebels who are persecuted, condemned, or suppressed at the time. but to a later age, they seem harmless and often essential to the elevation of human conditions. The enormous success of science has led to the general belief that scientists have developed and are employing a "method" - a method that is extremely effective in gaining, organizing, and applying new knowledge. Galileo, famous scientist of the 1600s, is usually credited with being the "Father of the Scientific Method." His

method is essentially as follows: 1. Recognize a problem. 2. Guess an answer. 3. Predict the consequences of the guess. 4. Perform experiments to test predictions. 5. Formulate the simplest theory that organizes the three main ingredients: guess, prediction, experimental outcome. Although this cookbook method has a certain appeal, it has not been the key to most of the breakthroughs and discoveries in science. Trial and error, experimentation without guessing, accidental discovery, and other methods account for much of the progress in science. Rather than a particular method, the success of science has more to do with an attitude common to scientists. This attitude is essentially one of inquiry, experimentation, and humility before the facts. If a scientist holds an idea to be true and finds any counterevidence whatever, the idea is either modified or abandoned. In the scientific spirit, the idea must be modified or abandoned in spite of the reputation of the person advocating it. As an example, the greatly respected Greek philosopher Aristotle said that falling bodies fall at a speed proportional to their weight. This false idea was held to be true for more than 2,000 years because of Aristotle's immense authority. In the scientific spirit, however, a single verifiable experiment to the contrary outweighs any authority, regardless of reputation or the number of followers and advocates. Scientists must accept facts even when they would like them to be different. They must strive to distinguish between what they see and what they wish to see -- for humanity's capacity for self-deception is vast. People have traditionally tended to adopt general rules, beliefs, creeds, theories, and ideas without thoroughly questioning their validity and

to retain them long after they have been shown to be meaningless, false, or at least questionable. The most widespread assumptions are the least questioned. Most often, when an idea is adopted, particular attention is given to cases that seem to support it, while cases that seem to refute it are distorted, belittled, or ignored. We feel deeply that it is a sign of weakness to "change out minds." Competent scientists, however, must be expert at changing their minds. This is because science seeks not to defend our beliefs but to improve them. Better theories are made by those who are not hung up on prevailing ones. Away from their profession, scientists are inherently no more honest or ethical than other people. But in their profession they work in an arena that puts a high premium on honesty. The cardinal rule in science is that all claims must be testable -- they must be capable, at least in principle, of being proved wrong. For example, if someone claims that a certain procedure has a certain result, it must in principle be possible to perform a procedure that will either confirm or contradict the claim. If confirmed, then the claim is regarded as useful and a stepping-stone to further knowledge. None of us has the time or energy or resources to test every claim, so most of the time we must take somebody's word. However, we must have some criterion for deciding whether one person's word is as good as another's and whether one claim is as good as another. The criterion, again, is that the claim must be testable. To reduce the likelihood of error, scientists accept the word only of those whose ideas, theories, and findings are testable -- if not in practice then at least in principle. Speculations that cannot be tested are regarded as "unscientific." This

has the long-run effect of compelling honesty - findings widely publicized among fellow scientists are generally subjected to further testing. Sooner or later, mistake (and lies) are bound to be found out. wishful thinking is bound to be exposed. The honesty so important to the progress of science thus becomes a matter of self-interest to scientists.

NEW WORDS

represent vt. be a sign or symbol of. act for 代表
collective a. of or shared by a group of people 集体的
insight n. the power of using one's mind to see or understand the true nature of a situation 洞察力
wisdom n. intelligence and good judgment 智慧
reoccur vi. occur again
dependability n. reliability, trustworthiness
prediction n. the act of predicting or sth. predicted 预测
headway n. motion forward. progress
answerable a. able to be answered
replace vt. take or fill the place of
superstition n. a belief or practice based on ignorance, faith in magic or chance
systematic a. of, having or using a system. carried out according to a system
supernatural n. outside of or beyond the natural world 超自然的
opposition n. the act or condition of opposing.
resistance n. stationary a. not moving or changing. not capable of being moved
hesitation n. the act of hesitating
publish vt. print and offer for sale
circulate vt. (cause to) spread widely. move or send around 传播, (使)流传, (使)循环
heretical a. (of opinion) opposed to established beliefs or standards 异端的
ban vt. forbid by law or decree
largely ad. for the most part. mainly
infinite a. having or seeming to have no limits. endless. very large
imprison vt. put in prison
popularize vt. cause to be well known and generally liked or used. make (a difficult subject) easily understandable to ordinary people 使普及

; 推广 geologist n. a person who knows much about geology 地质学家
violenta. having, showing, or resulting from great physical force.
showing or having strong feelings 强暴的 ; 猛烈的
condemnation n. express strong disapproval of, pronounce guilty of crime or wrong
谴责 ; 宣告...有罪
condemnation n. genesis n. the beginning or origin: (G-) the first book of the Old Testament 起源.(《旧约全书》第一卷)《创世纪》
geology n. the study of origin, structure, and history of the earth 地质学
evolution n. slow, gradual development. the scientific theory that all living things developed very slowly over millions of years from simpler forms of life 进化 (论)
crossway n. crossroad. a road that crosses another
progressive a. moving forward step by step. favoring or promoting improvement or reform
appoint vt. name for an office, duty or position 指定 , 任命
rebel n. a person who resists or opposes authority 反叛者
persecute vt. treat continually in a cruel way, esp. because of political or religious beliefs 迫害
suppress vt. stop or put down by force. keep in, hold back 镇压 ; 抑制
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