account of public knowledge are absolutely central and widespread within traditional philosophy (Musgrave 1993), they are by no means universal with modern philosophers. Many contemporary epistemologists make a distinction between strong and weak knowledge; Goldman (1999) is one example. Strong knowledge covers justified-true-beliefs and justified-true-(community-accepted)-statements. Weak knowledge is like strong knowledge except that the justification component is omitted. Thus, weak personal knowledge consists of beliefs which are true, and weak impersonal knowledge consists of community held views that are true. It has been suggested earlier that the concept of weak personal or public knowledge, in its recorded form, is suitable as a view of information.

Ackoff, and the early systems theorists, tend to use a "know-how" concept of knowledge. Examples of know how are that a person knows how to ride a bike or knows how to play chess. There are philosophical accounts of know-how (see, for example, Fantl 2016). Know-how is often analyzed in terms of ability; a person knows how to ride a bike if they have the ability to ride a bike. Another strand that can feed into the analysis is intellectualist vs. anti-intellectualist approaches and this is to do with the extent to which know-how is parasitic, symbiotic, or dependent, upon know-that. An intellectualist might say that, in chess, if a person knows that a pawn can advance two squares on the first move, knows that bishops move diagonally, etc. etc. then that person knows how to play chess. In other words, knowing how to play chess merely amounts to knowing a suitable collection of know-thats. This intellectualist account is much less plausible with a case like riding a bike. Which know-thats, exactly, does a bike rider have to have in order to know how to ride a bike? The bike rider cannot say, nor, seemingly, can anyone else. At this point, the anti-intellectualist might trumpet: know-hows have nothing to do with know-thats. This might be a reasonable conclusion, but the intellectualist is not quite dead yet. The intellectualist can introduce the idea of "tacit" knowledge (Polanyi 1958, 1967). This is knowledge, know-that knowledge, that someone has but which they cannot say, articulate, or put into words. In general, there is plenty of tacit knowledge (though there is a question of whether that concept belongs here). So, the intellectualist might argue that the know-how of a bike rider is dependent on a collection of know-thats, but the know-thats are tacit and difficult to make explicit.

The Ackoff tradition uses know-how and it relates that to ability. DIKW swirls in data and information, which is to suggest that DIKW has a lot of connection at the lower levels with propositions and know-thats. This, in turn, suggests that the systems theories would take an intellectualist view of know-how (that know-how is intimately related to know-that). Finally, this position really requires some use of tacit knowledge.

3.4 Wisdom

That leaves wisdom. The concept of wisdom certainly occupied the ancient Greek philosophers, such as Plato and Aristotle; although it has not been a popular topic of discussion in recent times. There seem to be several different strands to wisdom (Ryan 2013; Sternberg 1990, 2017). A wise person needs to have an understanding of the epistemic status of what he or she knows, i.e., they have to be a fallibilist—Socrates was considered wise largely because all he knew was that he knew nothing. Then, almost in contradiction to this, a wise person has to know, fallibly, plenty. A person that genuinely knows little or nothing, a person with an empty head, is not a wise person. Then this wide knowledge has to be of a certain kind, a kind that applies to the many and varied problems of life. A person may have encyclopedic knowledge of the facts and figures relating to the countries of the world, but that knowledge, of itself, will not make that person wise. The wide knowledge has to be applicable to tricky problems of an ethical and practical kind, of how to act. (Nozick 1989, 269):

> Wisdom is not just one type of knowledge, but diverse. What a wise person needs to know and understand constitutes a varied list: the most important goals and values of life—the ultimate goal, if there is one; what means will reach these goals without too great a cost; what kinds of dangers threaten the achieving of these goals; how to recognize and avoid or minimize these dangers; what different types of human beings are like in their actions and motives (as this presents dangers or opportunities); what is not possible or feasible to achieve (or avoid); how to tell what is appropriate when; knowing when certain goals are sufficiently achieved; what limitations are unavoidable and how to accept them; how to improve oneself and one's relationships with others or society; knowing what the true and unapparent value of various things is; when to take a long-term view; knowing the variety and obduracy of facts, institutions, and human nature; understanding what one's real motives are; how to cope and deal with the major tragedies and dilemmas of life, and with the major good things too.

And the wise person must not only have wide appropriate knowledge, but they must act in accordance with the knowledge they have—they need to use their knowledge when required and not to ignore it by choice or chance.

The DIKW account of wisdom, in its Ackoff version, is reasonably in harmony with this. Ackoff, and his immediate followers, were systems theorists, they were control theorists. Knowledge, was know-how, know how to con-