Complementing the Future

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Since variability pervades the whole cosmos at some level, the longer the run of data the greater the potential for revealing new science. Astronomy possess a heritage of (mostly photographic) observations that is the envy of many other scientific disciplines – yet at present we have no tools to take appropriate advantage of it. I will argue that it is what we may learn from studies of 20th-century data, but using 21st-century technology, that has the huge potential to shape knowledge in the 21st. However, nothing substantial will be achieved unless or until those observations are transformed into digital formats. With something like 1 million spectra and 2 million or more direct/objective prism plates currently archived in plate stores around the world, we have an interesting challenge to streamline digitizing processes that are rapid, accurate and consistent. New science is already emerging from pilot studies of 80 years’ observations in the Harvard archive: in just one region scanned (0.1% of the whole collection), nearly 500 new variables have been identified, including a few that show massive decade-long changes. Accurate proper motions can also be achieved. By collating 20th-century resources in such a way, 21st-century astronomy will become truly wiser about, inter alia, the nature of stars and stellar evolution.