

## SLEEP IN A NONAGENARIAN: N. KLEITMAN

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Over the last twenty years of his life I had the unique opportunity to know Dr. Kleitman both personally and become familiar with his sleep in a research protocol.

Dr. Kleitman was followed biennially from age 86 to 94 (1981 to 1989) as perhaps the most famous member of our cohort of aged subjects, the Bay Area Sleep Cohort (BASC), whom were followed prospectively over time in a study of sleep and aging. As he was in most of his life, Dr. Kleitman was an anomaly in the BASC. Until he died, he was the oldest surviving member of BASC and one of the few who did not reside in the immediate San Francisco Bay Area, having lived the last 35 years of his life in southern California. What follows below are: first, observations regarding Dr. Kleitman's sleep and health in late life and then, second, my own anecdotal observations regarding interactions with this most extraordinary man. The request to discuss his health data was made by me in writing to Dr. Kleitman several years prior his death. To quote directly from his response: "Regarding your request to write up some of what you learned about my own sleep when I was studied at Stanford, I am not in a position to approve or disapprove, as I cannot judge the meaning or possible application of observations made on me. Be that as it may, I hereby extend my permission to you to publish whatever you deem to be relevant or of interest." (personal communication from Dr. Kleitman, May 21, 1997). Always the wary and skeptical scientist, readers are encouraged to take Dr. Kleitman's admonishment to heart; an N of 1, no matter how famous the individual, is still just a case report.

### SLEEP AND HEALTH OBSERVATIONS

Dr. Kleitman was studied on 5 separate occasions for a total of 11 nights over 8 years. He demonstrated sleep patterns fairly typical of a man of his age including decreased delta sleep, some sleep disordered breathing which varied appreciably from night to night but did not appear to increase with age, and occasional periodic leg movements during sleep. The protocol in which he took part was moderately rigorous and included full pulmonary function testing with arterial blood gas analyses, complete blood chemistries, electrocardiography, repetitive blood pressure assessments, lateral cephalometrics and a full battery of neuropsychological testing. To briefly summarize a few of these findings, Dr. Kleitman had well preserved lung function, normal blood gasses, and normal blood chemistries,

including glucose, thyroid, and albumin. He was normotensive and fell above age norms for performance tests such as Trailmaking and Raven Progressive Matrices.

It is difficult to know what one can conclude scientifically from such an exceptional case that was, in all likelihood, so unrepresentative of the geriatric population. On the other hand, survivorship bias may have well played a role in the results, in that anyone living to the age of 104 must, by definition, be atypical. Dr. Kleitman's own words notwithstanding, only time and further research in populations of older persons will shed light on these important issues.

#### PERSONAL OBSERVATIONS

Dr. Kleitman's gritty character (even beyond taking part in a modestly vigorous research protocol on a regular basis throughout his 90's) was never more apparent than on one of his plane trips to the Bay Area to participate. On one of his scheduled visits to Stanford, Dr. Kleitman had been scheduled to fly into San Jose airport, approximately 25 miles from Stanford, where we were scheduled to pick him up. Some confusion occurred over his exact time of arrival and this fact (plus the San Jose rush hour traffic) resulted in both me and my assistant, Julia Zarcone Pattmore (Vince Zarcone's daughter), arriving late to the airport. Alas, the plane had arrived but Dr. Kleitman was nowhere to be found. Confusion and panic reigned supreme. Despite what would otherwise be the conspicuous appearance of a frail, 90 year old man with white hair, thick glasses and a cane, neither airport security, flight attendants, or baggage claim workers were able to provide any information on his whereabouts. I suppose anyone would feel a twinge of anxiety having just lost a 90 year-old family member, however the fact that that this was Nathaniel Kleitman and, as a consequence, the sleep community world-wide would be passing judgement on me should anything happen to him, was unbearably stressful.

At any rate, after about 3 hours of phone calls and visits to police stations, airport personnel, and scouring downtown San Jose by car looking for Dr. Kleitman, I finally arrived back at my office at Stanford's Hoover Pavilion sleep lab being fully resigned to sit down at my desk and wait for the phone to ring with presumably dire news. Upon arriving however, I was met at the elevator by Julia who told me that during my absence Dr. Kleitman had arrived safely and was now in his bedroom in the lab. He had apparently traveled via Santa Clara County transit bus service (not an inconsequential trek—consisting of three transfers and taking well over 2 1/2 hours). When I entered the room to greet him, Dr. Kleitman was his usual feisty self and naturally needled me about not being on time to pick him up. He also told me he pulled off the entire caper for only a dime, having taken full advantage of several transfers, as well as employing his rightful senior citizen's discount.

I could not help but think of how lucky we were that this all worked out, but at that very moment I also had a full appreciation of the character of the man who

had gone underground at Mammoth Cave so many years before to explore biological rhythms firsthand. This incredible fortitude, pluck and resolve, still in evidence over 55 years later, spoke to a sense of exploration and adventure, that, in his early years of studying sleep, may have served him well in pushing the envelope of knowledge about a state on which virtually nothing scientifically was known. Apart from sheer character, these observations also indicated that Dr. Kleitman had command of organizational problem solving, orientation, and short-term memory, put to test unexpectedly, in this very real world situation.

As a final note, I would like to mention my last in-person interaction with Dr. Kleitman occurring on the final day of the 1995 APSS meeting in Nashville at which he was honored on his 100<sup>th</sup> birthday. I was slotted to present a paper in the Sleep and Aging session of the final day of the conference, and, as is typical of such an ill-fated draw, found myself speaking in a large room with nary more than about 20 or 25 people present. Dr. Kleitman was among that audience. In fact, he stayed for the entire morning session, right up to the last paper at noon. As the final session broke and individuals scurried about collecting their slides, saying final goodbyes and hurrying to catch planes, Dr. Kleitman, accompanied by his daughter, made their way back, walking slowly through the mile long corridor of the Opryland Hotel. As I whisked by him and waved, I could not help but feel that this was a man whose pursuit of knowledge about a topic of interest to him on that particular Sunday morning was the same dogged pursuit of knowledge he followed for its own right in his own way in his own time throughout his career. I will be always grateful that he shared a little bit of that time with me.