

Owen's Bodega Bay Workshop on Polarizing Antiprotons

Owen Chamberlain Memorial

A D Krisch 30 April 06

I will talk about a Workshop that brought together two of Owen's lifelong physics interests: antiprotons and polarization. The Workshop occurred at Bodega Bay in April 1985. However, the idea for the Workshop started at the September 1984 SPIN Symposium in Marseille France; Owen, Ernest Courant and I were at a swimming pool overlooking the Mediterranean.

Owen started telling us about his recent visit to Van de Meers' antiproton accumulator ring, which allowed one to store and then collide high-energy beams of antiprotons in the CERN SPS. He told us how amazed he was that CERN could now store high-intensity beams of antiprotons; accelerate them to hundreds of GeV; and then collide them. He recalled that he and Segre had to wait hours to see a single antiproton. Then we all went swimming; Owen was thin and frail; I easily beat him during the first few laps. However, I involuntarily quit after four laps, while he continued for six more laps.

After we got dry, recalling his amazement at CERN's antiproton Collider, Owen suggested that perhaps one should try to polarize antiprotons; this led to much discussion, but it was soon clear that none of us had any idea of how to do it. However, as senior members of the Spin Mafia, we felt that we should try. Ernest said that he did not know much about antiprotons; I shared his lack of knowledge, but I agreed to help Owen organize a workshop on polarizing antiprotons for a long weekend at some isolated spot near Berkeley.

Since we no idea how to polarize antiprotons, we decided to encourage crazy ideas; thus, we included a request for "crazy ideas" in the invitation letter. To further encourage crazy ideas we decided to each give an introductory talk with a very-crazy idea so that others might be willing to present slightly less crazy ideas.

Now we move forward 8 months to Bodega Bay California in April 1985. Twenty-one physicists from many possibly relevant areas had gathered at the isolated and very nice Bodega Bay Lodge, which was very competently arranged by Jeanne Miller. One problem was that there were 21 physicists and 20 available rooms; this occurred because Dan Kleppner of MIT telephoned me with a last-minute request to invite a young physicist from Washington named Jerry Gabrielse (that MIT was trying to hire). I immediately telephoned Owen and Jean with this request; Owen enthusiastically supported inviting him. However, Jeanne pointed out that there were 20 rooms and we already had 20 participants; Owen immediately responded that perhaps he or I could share our room with this smart young physicist. I then succeeded in saying nothing for several minutes; Owen then volunteered to share his room and did. Gabrielse later went to Harvard and used the CERN Antiproton Accumulator Ring to make the world's first anti-atoms and has done beautiful atomic physics experiments with them; I hope he appreciates the help he received from Dan Kleppner and Owen.

The Workshop Agenda split us into 5 five working groups on different possible efforts. Simone van der Meer first reviewed the status of CERN's Antiproton Accumulator. Then all five Working Group Coordinators, including Owen and me, each reviewed some possible techniques in their area. Owen spoke on his "crazy idea" of using a variation of van der Meers' stochastic cooling to monitor the polarization of each proton bunch as it passed one side of the ring and then send fast signals to the other side of the ring with instructions: be nice to the protons with a good polarization and to be mean to those with a bad polarization. During Owen's talk, van der Meer looked very unhappy and started working fiercely on some calculations. When Owen's talk ended, van der Meer asked for permission to reply. He then said very politely that Prof. Chamberlain's idea was very interesting; however, it had one small problem; he then showed his calculations indicating that Owen's signal to noise ratio was 10^{-42} ; I recall Owen slowly sliding down in his chair as van der Meer progressed. Owen clearly beat me in proposal craziness level; my proposal was a moving Dynamic Nuclear Polarization with microwaves transferring the polarization of a polarized electron beam to an antiproton beam with exactly the same velocity. My idea was quickly demolished by Carson Jeffries and Dan Kleppner, but somewhat more politely and only by a factor of about 10^9 .

Fortunately, some of the other ideas did work to some extent. Aki Yokosawa's idea of catching the polarized antiprotons from the decay of a high-energy beam of naturally-polarized anti-hyperons was implemented at FermiLab; the intensity was rather low, but they made a beam of 200 GeV polarized antiprotons and did some nice experiments with them. Erhardt Steffans' spin filter idea was tested at the small Max Planck ring in Heidelberg and produced a few per cent polarization; this work may be carried on by a team from COSY-Jülich working at the new FAIR facility being built at GSI- Darmstadt. Perhaps Owen's crazy idea did bear some fruit.

Thank you.

A Story about Owen's House and Owen's Nobel Prize*

In 1959, Larry Jones, a Michigan colleague, went to Berkeley with his family for the fall and rented the house of Owen Chamberlain, who was at Harvard on Sabbatical. One night in October at about 1 a.m. the phone rang. Larry's wife Ruth awakened and was asked "Is this the Chamberlain residence?" After she sleepily answered "Yes", a reporter from the Oakland Tribune said "Our Associated Press office in Stockholm just notified us that Owen Chamberlain is to be awarded the Nobel Prize this year." Ruth Jones then said "Larry, Larry, did you hear that? Owen won the Nobel Prize!" The reporter then said "Mrs. Chamberlain, perhaps this is a bad time for you, we'll call back later." and hung up.

The moral of this story is: If there is any chance you might win a Nobel Prize this fall, make sure that you are on your best behavior and your spouse is on his or her best behavior.

* I was strongly encouraged to add this story by Andy Sessler and Larry Jones