

Antonio García-Bellido in Caltech

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Antonio García-Bellido first came to Caltech on a three year Gosney Fellowship commencing in 1967. This fellowship had been created from funds raised by George Beadle when he was chairman of the Biology Division. It was often awarded to young foreign scholars such as Antonio who, at that time, would have had difficulty finding other sources of support.

Antonio brought his wife, the late Maria-Paz Capdevila, also a biologist, who was to play a prominent role in his research, and their two young children. Antonio had just come from the University of Zurich where he had been a post-doctoral fellow in the laboratory of Ernst Hadorn, who had developed a method of culturing imaginal disc cells of *Drosophila* larvae in the abdomen of sterile adult females. Antonio had mastered this method and saw its unique advantages for studying the properties of imaginal disc cells of mutants of the *bithorax* complex (BX-C). He immediately began acquainting himself with all of the available mutants of that complex which were in our Caltech collection.

In August 1967 John Merriam joined our genetics group as a postdoctoral fellow. Antonio and John collaborated in developing the fate mapping of the *Drosophila* embryo. I remember well the excitement generated when Antonio and John realized that Sturtevant had cleverly used cell markers in gynandromorphs to begin such mapping. He generously provided them with extensive unpublished data. Sturtevant, too, was excited in his quiet way, and delighted to see a renewed interest by these bright young investigators in work he had published some 40 years earlier, (Sturtevant, 1929).

The nearly three years Antonio spent on his first visit overlapped shorter stays by John and other visitors to our *Drosophila*

groups, including Michael Ashburner, Erik Bahn, James Crow, and David Hogness. They were exciting and profitable times for all of us since Sturtevant was active at that time and in the Morgan tradition the door to his laboratory was always open. John Merriam describes (see this issue), much better than I can, how much the group benefited from their interactions with Sturtevant and from the unhurried style in which science was conducted at that time.

Antonio and John also found time to conduct cell lineage experiments using the technique of inducing mutant clones of various sizes by X-raying at different stages of larval development. In this way they derived estimates of the number of blastoderm cells that give rise to the mature imaginal discs and hence to the corresponding adult tissues. The germ of the compartment hypothesis, that was later to play such an important role in Antonio's research, must, I would guess, have come out of these experiments.

Antonio returned to our *Drosophila* group as a Distinguished Fairchild Scholar with his wife and children from July 1974 to May 1975. This was a time when he completed his studies of the properties of imaginal disc cells of mutants of the *bithorax* complex -work that was published in 1976 (García-Bellido and Lewis, 1976). It was a special time since Rolf Nöthiger and his family also spent that year with us. His family and Antonio's were long time friends, Antonio having met Rolf when they were both postdoctoral students in Ernst Hadorn's laboratory in Zurich -Rolf also received his Ph.D. under Hadorn. We were frequently joined by Alain Ghysen who spent that year in Seymour Benzer's group. Antonio and I spent a great deal of time talking not only about the *bithorax*

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Caltech reminded visitors of a monastery. *You only saw glimpses of students slipping quietly between corridors and gardens. The solemnity of the 'Mission Revival' architectural style reinforced this impression. (John Merriam)*

complex but also about the possibility that the *scute* and *achaete* loci might be another gene complex. Indeed Alain tells me that his listening to these discussion led him to switch the direction of his research from behavior to neurogenesis. Another interesting outcome were discussions of the engrailed mutant as Antonio has explained elsewhere; namely, I had told him how the original *engrailed* mutant had the posterior border of the wing transformed

toward the anterior border. I only knew about it because I had checked the entire collection from time to time and was surprised to find that the description did not mention the posterior to anterior transformation, but Miss Wallace's drawing did show it! When I pointed out this phenotype to Antonio he was of course very excited. Here was another example of a homeotic transformation which fitted the compartment hypothesis.

Antonio is a master at explaining phenomena metaphorically. To illustrate, I would like to quote from the opening remarks which he made at a Symposium in India (García-Bellido, 1980). He is referring to the difficulty of analyzing the complexities that arise in developmental biology and neurobiology. "In my view, the best instrument to see order in this jungle is genetics. Genetics is precisely a science of interaction. It is effectively discovering the elements of a set, and establishing their hierarchical relationships; it is a science of grammar rather than of phonetics. It could help us as the Ariadna's thread to not get lost in the labyrinth. If genetics is going to be the Ariadna's thread... I would urge everyone, including myself, to contemplate the beautiful Ariadna, but care even more for the thread. I want to end these opening remarks paraphrasing the last words of Goethe: Genetics, more genetics." (García-Bellido, 1980). Antonio combines a number of attributes rarely found in a single investigator. A strong background in the physical, as well as the biological sciences, including in the latter case, classical embryology; a firm command of formal genetics; and a similar command of modern molecular genetics. Take an analytical and intuitive mind, stir in these attributes, and you have a unique biological specimen: Antonio García-Bellido.

References

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