Analysis of Future Trends In Surfboard/Sailboard Construction

I. History of Surfboard Construction

Several times in the past it has appeared that a "new" construction-method would change surfboard construction materials overnight. History has shown us, however, that with the exception of urethane foam, no construction material has had an overnight success. Along the same line, due to in-water performance, no semi-rigid surfboard (or sailboard) has ever been able to qualify as anything more than a low cost, or beginners board, from the moment of introduction. Consequently, they will be mostly excluded from this discussion.

*Not an exact date, or the exact date cannot be determined.

The key technological developments in boards which either had a major impact or great potential at the time were:

?- Ancient, solid wood surfboards by Hawaiians. This was carried forward in many sizes, woods, and laminations through the 1950's.

1926- First use of balsa wood, by Lorrin Thurston of Hawaii.

1929- Hollow wood board, built and patented by Tom Blake.

1947- Fiberglass/polyester using balsa wood, first introduced by Bob Simmons.

1950*- First foam board using polystyrene foam and epoxy, by Bob Simmons. Hobie Alter and others built limited numbers of these boards in the 1950's.

1958- Hobie Surfboards came out with the first fully developed molded urethane blank, "custom" shaped foam board. At the same time, the Hobie factory was using most of the "custom" board glassing techniques still in use today and Hobie had developed the center stringer. Since about 1955, there had been several attempts at urethane, but Hobie was the first to put the entire package together.

1959*- The word "pop-out" was coined as a number of molded (non-shaped), urethane boards appeared on the market. Dave Sweet's "hard-shell" and Chuck Foss's "mat blanks" were the most successful early innovations.

1967*- Carl Pope's epoxy-prepreg-honeycomb hollow "Wave" board was developed and heavily marketed.

1969*- Sailboard "pop-outs" were started. In the United States, this was led by Hoyle Schweitzer at Windsurfer. A urethane core with a thermoplastic skin was used for all initial development. In Europe, this

technology exploded.

1970* - The epoxy-polystyrene "custom" built sailboards started to appear in Europe. For the first time, specialized epoxies for surfboard lay-up were developed, along with hot wire shaping techniques.

1983* - It became clear that many major European manufacturers were going to a molded polystyrene core and were beginning to get serious about molded epoxy skins. This was not a new material or construction method, but more a major trend and refinement of a very old concept.

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Why Study History?

At this time, there is an explosion of new technologies and materials appearing which may dramatically change surfboard and sailboard construction.

In cloths, we have new fibers, weaves, and even knits. In resins, there are new concepts such as alloys, hybrids, and interpenetrating networks. New ester types, new epoxies, new urethanes, and new foams are appearing all the time.

As history has shown, when new materials appear, there are going to be innovators with the courage and foresight to develop new techniques and use new materials. Also, history has shown us while some innovations will succeed, others will fail.

By now, there is a pretty clear pattern of what works and what does not. This is worth looking at.

Compromise

An Austrailian put a sail on a very short surfboard, took it to Maui and ended the European sailboard maker's massive lead in high performance boards. Why? Europeans had gone overboard for cheapness and durability. They had neglected weight. They called "custom" boards "egg shell" construction and knocked them in the media. Today, they use "custom" epoxy-polystyrene construction for their "World Cup" boards - carefully disguised as "stock" and their paid riders use regular urethane blanks for high wind/wave riding boards. The exact same situation faced the urethane "pop-out" of the 1960's. They emphasized durability and price. A couple of shape changes, lighter weight (and a few other improvements), and they

disappeared. On the other side, some manufacturers jumped into Clark Foam ultralights when they first came out with inadequate testing. They fell apart, discrediting everyone involved.

The balance or compromise between properties is extremely delicate. To ignore a single property, even though it appears there is a substantial gain in the other properties, is dangerous. The above example of the indestructible slugs produced in Europe before 1980 is an excellent study of this type of error.

In the examples of specific construction given in the rest of this paper, keep the concept of compromise in mind.

Wooden Era

The ancient Hawaiians evidently tried most sizes, shapes, and had several adequate woods. There was, therefore, no real reason for improvement or choice until 1926 when balsa was first used. By all reasonable logic, balsa, should have dominated surfboard construction after 1926. It was, certainly, intermittently available.

The fact was, however, that balsa was not universally used for about 25 years. In 1929, hollow boards stole the show, followed by redwood and laminated balsa-redwood. There were, in fact, no prevailing methods of construction until balsa-fiberglass came on strong in the early 1950's. The problem shared by both balsa and the hollow board was water absorption. The other big problem with balsa was strength. The compormise was redwood, which is relatively light, strong, and very waterproof.

Early Foams

Bob Simmons, Hobie, and others dropped polystyrene because of the hassle of epoxy, deterioration, etc. Their reasons were also partly due to the state-of-the-art of glassing to foam. The development of the urethane foam core had the opposite effect. There was an initial acceptance as a "new" thing followed by a wave of acceptance as the maintenance free feature took hold. Then a very strange thing happened. Due to the scramble to get into foam, there were a lot of really weak foams introduced to the market. To compensate for the weak foam, glass was increased and many of the first foam boards outweighed balsa. By todays weight conscious standards, the above fact seems impossible. Switch back to balsa for a few years and you