

Abstracts of Papers Presented at Conference
"Medical Aspects of Swimming and Diving"
Loughborough, April 1964

1. Physical Evaluation in Competitive Swimming.
 2. The Health of Competitive Swimmers.
 3. Modern life saving, survival swimming and water safety.
 4. Some Physiological aspects of swimming training.
 5. Neurological injuries sustained through diving.
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The papers presented by Captain Hale and Mr. K. Sloccombe are published in full in the Sports Medicine Edition of "Physical Education".

Physical Evaluation in Competitive Swimming

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There are two broad aims to the programme:-

1. The first is a practical objective concerned with assessing the physical capacity of the swimmer in order to supply him, or preferably his coach, with information which can be immediately used in the determination of priorities in his training. Correctly informed, a coach can map out a critical path to championship performance. In furtherance of this objective A.D. Kinnear, Senior N.T.O., is pressing ahead with a scheme for the establishment of T&M Service units in each district or area in the country. A short course has already been conducted at the College of Advanced Technology for suitably well qualified A.S.A. coaches in order that the staffing of these centres should be of a high standard. A second course is being arranged, probably for next January, of a slightly longer nature.

2. The second aim is of a less immediate kind, but is the essential foundation to the first. It is concerned with the broader problems of swimming, with the examination of relationships between swimming performance and trainable factors (e.g. Strength, endurance, flexibility) between swimming performance and non-trainable factors (e.g. physique variables) and between both trainable and non-trainable variables.

The scope of the programme:-

Approximately 100 variables were examined in 11 basic areas.

1. Physique (Technique after Tanner and Whitehouse where possible)
 - a. Linear measures: Height, Leg Length, Arm span, Hand and Foot lengths.
 - b. Gross measures: Weight
Girths: Chest, Waist, Arm, Thigh
Areas: Surface, Hand and Foot
(Plantimeter tracing)
 - c. Fat Fold measures: Body, limbs (six sites) (Harpenden Caliper)
 - d. Somatotype measures (Seventeen measures) (Dr. Robson et al)

2. STRENGTH. Leg (Dynamometric evaluation)
Triple Thrust (Grip-Push-Pull)
Simulated stroke techniques - strength available
3. POWER. Leg and hip (Sargent Jump)
Arm and Shoulder (double arm 5lb
medicine ballthrow
from supine inclined
position)
4. FLEXIBILITY. Shoulder,hip,knee,ankle (Goniometer Screen,
Spine,hams Flexittract, Sit
strapped reach)
5. WATER TRACTION FORCE.
All Stroke techniques (Dynamometer in
static position)
6. BUOYANCY. Upthrust force in lbs (Hydrostatic weighing
in open topped perforated
zinc cage. Subject etc.)
7. RESPIRATORY FUNCTION.
Vital Capacity Dr. Bleasdale
Maximum Breathing Capacity
Peak Flow/F.E.V./T.V.C. (Occasional
Dr. Thompson et al)
8. CARDIOVASCULAR FUNCTION.
Daily resting pulse rate
Fletcher step test (Also Harvard, Tuttle,
Carlson Fatigue)
Post C.I.M. pulse rates
9. PSYCHOLOGICAL TESTS.
Eysenk: Likes and Dislikes, Personality
Inventories.
10. QUESTIONNAIRE:
Socio-economic background, training, diet,
sleep etc.
11. SWIMMING PERFORMANCE at various strokes and distances.

The slides that followed were chosen to illustrate some of the relationships that exist between a selected series of variables. As a result of an analysis of this kind it was thought that further steps could be taken to eliminate unproductive tests, to search for causal relationships, and to move still nearer the ultimate goal - the prediction of swimming potential from laboratory tests.

Mr. Atha demonstrated the relationship of a number of these variables showing their significance at the 5% and 1% level.

Swimmers compared to the normal population were heavier than 92% and taller than 83%. Compared with specialist PE students however they were of average height.

Track and Field athletes returned higher scores for the grip strength test, but swimmers were stronger on the Push test.

There was some relationship between gymnastic ability and the ability to swim. There was also a relationship between age and the distance swum in 5 min.; this could possibly be linked with the increase of the red cell count with age (5000 p.a.)