joints, perhaps associated with abnormalities of the ankle, would be welcome, both for this purpose and to further knowledge of a rare condition.

Summary

The distribution and variation of symphalangism (hereditary fusion of the proximal interphalangeal joints) in the Talbot family at the present day have been studied. Five living members of the family with symphalangism have been studied. In addition to the finger abnormality fusion of certain tarsal bones has been found in each.

The claim that transmission of symphalangism has occurred through 14 generations of the Talbot family has been re-examined. It is concluded that adequate proof of such transmission is lacking.

This condition also occurs in an American family of Scottish ancestry. It is suggested that both families may have a common stock in the British Isles. An appeal is made for information about individuals with symphalangism and tarsal fusion, as it may be possible by tracing their lineage to establish a link between the two families.

We owe debts of special gratitude to Dr. J. A. Fraser Roberts for the advice and encouragement he has given during the course of this investigation, and to members of the Talbot family for their willing and invaluable co-operation. We also wish to thank the Rev. C. A. Chamberlain, Rector of Whitchurch; R. M. Talbot, Esq., for Figures 2, 4, and 5; Miss Tulloch and Miss Gamble for assisting in the search of original records; the Radiographic and Photographic Departments of St. Thomas's Hospital; the British Museum newspaper library; the Librarian of Historical Collections, Yale University; the National Portrait Gallery; and the Endowment Fund of St. Thomas's Hospital.

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Preliminary Communications

Motor-car Driving and the Heart Rate

Brit. med. J., 1967, **1**, 411–412

We wish to report the preliminary results of electrocardiographic studies made during driving in normal London traffic and in competitive circuit racing.

Observations were made on nine subjects (seven men and two women) driving in peak London traffic, and on three during competitive circuit racing. All the drivers were healthy, aged 21 to 54 (mean 28), with a normal resting 12-lead electrocardiogram (E.C.G.). A left ventricular lead was obtained from two chest electrodes connected to a C and M radiocardiograph transmitter carried in the pocket. A receiver and tape-recorder were operated manually from the back seat in the case of city drivers and automatically from within the racing-car.

Driving in dense fast-moving traffic (Trafalgar Square) raised the heart rate from the resting range of 70–85 to 100–140 per minute. Two drivers (a man aged 28 and a woman aged 21) developed conspicuous ST–T changes when an anxiety situation occurred. Both the tachycardia and the ST–T changes subsided with tranquillity (Figs. 1 and 2). The drivers were not aware of palpitation, and felt nervous only during an anxiety situation.

Similar rate increases and ST–T changes occurred in a woman aged 21 and a man aged 54 on exercise. A further test was performed in order to assess the significance of the tachycardia as a cause of the ST–T changes. The woman aged 21, with the most striking ST–T changes occurring both on exercise and during anxiety situations while driving, was

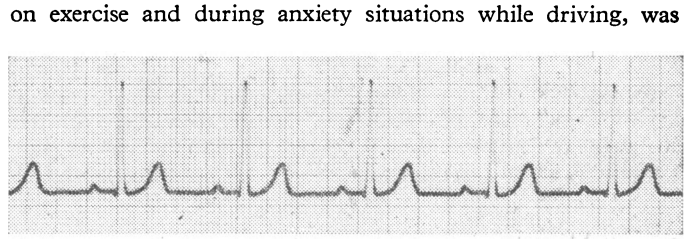

FIG. 1.—Subject A. B. Normal radio E.C.G. in tranquil subject in sitting position. The time scale for all recordings was the standard 25 mm./sec. paper speed (1 mm. sq.=0.04 sec.).

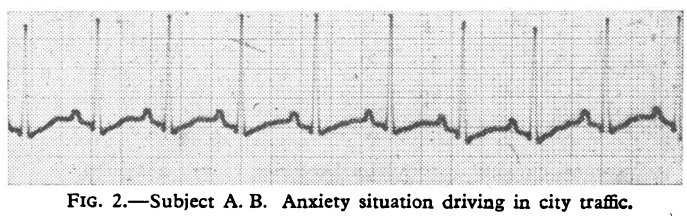

FIG. 2.—Subject A. B. Anxiety situation driving in city traffic.

given atropine. A dose of 1.2 mg. was injected intravenously to produce a tachycardia comparable to that at which the ST–T changes occurred. No ST–T changes were produced, though if a sudden severe fright was administered they then occurred. This suggests that both anxiety and exercise were producing similar E.C.G. changes, and that the rate increase itself was not responsible (Fig. 3).

In competitive motor-racing three healthy, experienced racing drivers had an increase in the heart rate to between 190 and 205. The rate was recorded at 150–180 in the 15 minutes before the start (Fig. 4), and at the signal indicating two minutes before the start a rate in excess of 180 was usual. This increased up to 200 to 205 by the time of the start (Fig. 5), and in some cases was maintained at this level continuously throughout the event. In the meantime the driver was unaware of palpitation or any other symptoms except for the natural nervousness experienced before any competitive event. The heart rhythm in all these observations was sinus tachycardia.

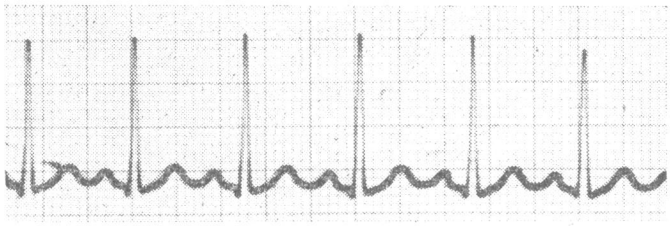

FIG. 3.—Subject A. B. Comparable tachycardia produced by atropine.

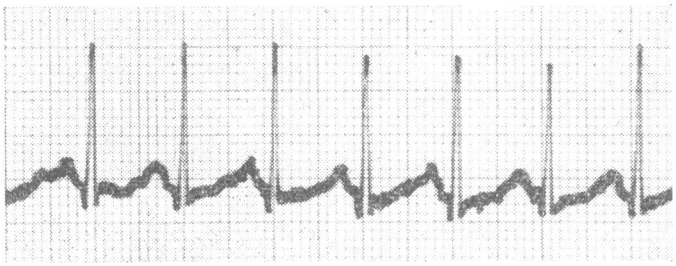

FIG. 4.—Subject C. D. Five minutes before the start of a motor race.

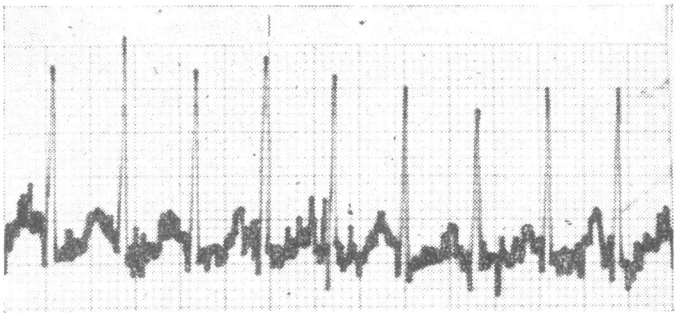

FIG. 5.—Subject C. D. One minute after the start, approaching a sharp bend at approximately 115 m.p.h. (185 km.p.h.).

SUMMARY

Motor-car driving in London traffic may be associated with an increased heart rate, which is very rapid in certain persons with normal cardiovascular systems. ST–T changes in the electrocardiograms occurring at the same time seem to be related to anxiety rather than the tachycardia. Even more rapid heart rates may develop in certain drivers before and during competitive motor-racing.

We wish to thank Dr. Walter Somerville and Dr. Richard Emanuel for their help and encouragement, and Sir Aubrey Rumball, of the Central Medical Establishment of the Royal Air Force, for the use of their radioelectrocardiograph.

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Medical Memoranda

Assessment of Possible Glucocorticoid Activity of Carbenoxolone Sodium

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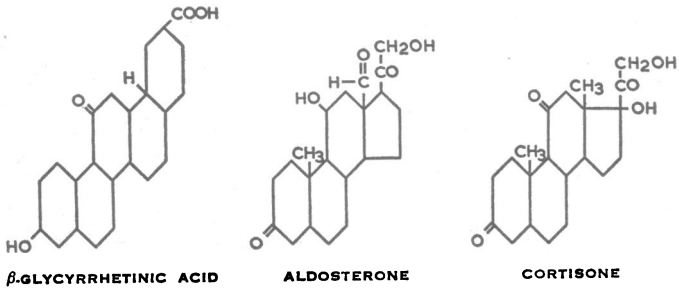
Carbenoxolone sodium (Biogastrone), which is the disodium salt of β-glycyrrhetinic acid, has recently been used in the treatment of gastric ulcer (Doll *et al.*, 1962; Turpie and Thompson, 1965; Middleton *et al.*, 1965). The chemical similarity to cortisone and aldosterone is shown in the Formulae. Like the glucocorticoid group of adrenal steroids, it possesses an oxygen atom at position eleven. It would not be surprising if carbenoxolone possessed glucocorticoid activity, and it is an investigation of this property which is the subject of this paper.



Structural similarity between β-glycyrrhetinic acid and adrenal steroids.

MATERIALS AND METHODS

Five men and five women (age range 35–72) receiving carbenoxolone for the treatment of gastric ulcer were studied. The dose given was 50 mg. thrice daily and treatment was continued for 16 to 37 days. Prior to the institution of therapy a 25-g. intravenous glucose-tolerance test was carried out (Boyd *et al.*, 1962) and repeated at the termination of the course of treatment.

Blood-sugar estimations were determined by enzymatic methods as "true glucose" (Huggett and Nixon, 1957), and the results of the glucose-tolerance test expressed as the glucose increment index (I.I.) (Amatuzio *et al.*, 1953).

Throughout the course of treatment body-weight, blood-pressure, and serum electrolytes were checked at frequent intervals.