

taken, the amount of the antidote necessary to counteract its effects would be fatal in itself.

The two drugs used by the Indianapolis doctors seem to avoid this difficulty, as they may be given in large doses without bad effect. They stopped the convulsions promptly and generally put the patient to sleep but without interfering with his breathing. The drugs were usually injected into a vein, but are also effective when given by mouth, it was found.

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PHYSIOLOGY

Teaspoonful of Alcohol Detected in Drivers

CONSUMPTION of about one teaspoonful of alcohol can now be detected in an adult as a result of improvement in technic in tests for alcohol in the blood, Dr. Klaus Hansen, professor of pharmacology at the University of Oslo, in Norway, recently stated in discussing application of the new technic to tests for drunkenness in drivers.

The University of Oslo Pharmacological Institute provides free of charge, to physicians making requests, boxes containing tiny glass tubes, fitted with rubber caps, to hold the blood of motor drivers whose sobriety has been questioned by the police.

Although this arrangement has existed only about 18 months, as many as 52 doctors in different parts of Norway have taken advantage of it, and have sent in 373 blood samples for test.

When the concentration of alcohol in the blood was from 2.61 to 5 per thousand, the clinical report of the examining doctor invariably indicated drunkenness on the part of the driver. In such cases the analysis would seem to be superfluous.

On the other hand, it was invaluable when it showed that the concentration of alcohol was so low that the driver could not possibly be under its influence, however excited and unreasonable his behavior. Dr. Hansen refers to a driver whose concentration was as low as 0.03 per thousand, a concentration found even when a person has not drunk any alcohol. Yet, this man was so nervous that he was assumed to be under the influence of alcohol. The analysis saved him from a compromising situation.

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PHYSICS-ASTRONOMY

Optician's Window Novelty Measures Heat From Stars

THE RADIOMETER — the little whirling device inside a glass bulb that is often seen spinning around in an optician's window—has now been used to study the spectrum photographs of stars, which show their composition. This application has been made by Dr. Sinclair Smith and Olin C. Wilson, Jr., of the Mt. Wilson Observatory, Pasadena, Calif.

The common form of radiometer, which was the invention of the great English physicist, Sir William Crookes, consists of four small vanes balanced on a pivot in a partially evacuated bulb. One side of each vane is polished, the other blackened, and the black side of one faces the polished side of the next. When heat radiation, either from the sun or an artificial source, falls on the vanes, they start moving, in the direction of the polished sides. The reason for this is that the black side absorbs more of the radiation than the other, and is heated more. The molecules of the small amount of gas remaining in the bulb are constantly in motion. When they hit the warmer side, they bounce off with a greater kick than those hitting the polished side, and so they push the vanes around.

In the arrangement developed by the Mt. Wilson scientists, two tiny vanes are used, suspended from a fiber of quartz. Thus they cannot turn completely around, as they twist the fiber. To the upper part of the fiber is attached a small mirror. A beam of light falls on this mirror and is reflected to a moving photographic film. As a greater or less amount of radiation falls on the vanes, the fiber twists more or less, and the reflected spot of light moves back and forth, leaving a trace on the film.

The spectrum photographs to be studied are negatives, and show a series of parallel clear lines, of which the relative brightness and widths are significant, as well as their positions. To study them, a strong light is focused to a narrow line on the plate, which is then steadily moved by an electric motor. The light that passes through, and the heat that accompanies it, varies with the intensity of that part of the spectrum plate. This heat falls on the radiometer,

and thus the moving spot of light reflected from the mirror traces on the film a record of the intensities of the spectral lines.

Such a device is called a registering spectrophotometer, and previous ones have used either thermocouples or photoelectric cells to detect the light changes. The former converts the heat into electric energy, while the latter makes a similar conversion of light. Dr. Smith states that the new device avoids the electrical difficulties accompanying each of these, and that it is more sensitive than the thermocouple. He also says that it is much simpler, and that many institutions might build one, though unable to afford the other and more expensive instruments.

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PSYCHOLOGY

Mathematical Formula Describes Legislator's Vote

THE COMPLEX factors leading to the vote of a legislator, including such items as party affiliation, lobbying, campaign pledges, bargaining, and so on, can all be taken account of in a single mathematical formula which will indicate his vote on a particular measure, Dr. L. L. Thurstone, psychologist of The University of Chicago, indicated in the *Journal of Social Psychology*.

In his equation, the first part represents the individual member's attitude toward a proposal. In the second part, the loading of one factor, say party affiliation, in this proposal is multiplied by the strength of the member's affiliation with that factor and added to a similar product for other factors.

Other more complicated equations were proposed by Dr. Thurstone to express mathematically the total of all the attitudes of a single member and the total of all the attitudes of the whole legislative body. Working from these equations, it is possible to list and name the various factors which "load" a particular measure, as well as to discover any individual member's identification with these factors, he showed.

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