the Regents' resolution of April 21, 1950, was and is invalid, being in violation both of Section 3 of Article XX and Section 9 of Article IX of the Constitution of the State of California, and that petitioners cannot be denied reappointment to their posts solely because of their failure to comply with the invalid condition therein set forth.

Subject to such reasonable rules of tenure as the Regents may adopt, the appointment and dismissal of professional personnel of the University is a matter largely within the discretion of the Regents. Nevertheless, in the event of proof of an abuse of discretion the "propriety of the remedy . . . is clear." Thus in the present case the imposition of the oath in question being violative of the applicable constitutional provisions, the abuse of discretion is clear, and hence this court may compel the reinstatement of petitioners to their respective positions.

In view of the foregoing it is unnecessary to consider the further contentions of petitioners that the resolution of July 21, 1950, constituted an irrevocable appointment of the petitioners, and that the action of the Regents constituted an arbitrary dismissal in violation of petitioners' tenure rights.

Therefore, since the letters of appointment issued to petitioners following the Regents' resolution of April 21, 1950, were subject to the condition that the petitioners sign letters of acceptance of appointment containing the affirmative statement, the requirement of which we have held to be invalid, it is the order of this court that the writ issue directing respondents by their secretary, respondent Underhill, to issue to each of the petitioners a letter of appointment to his regular post on the faculty of the University, which appointment shall not be subject to the aforementioned invalid condition. Provided that, if any of petitioners has not yet executed the constitutional oath of office as provided in the said resolution of April 21, 1950, the respondents may require that such petitioner, as a condition precedent to his appointment, execute said constitutional oath.

Let the writ issue.

THE following resolution on the University of California "oath" was passed at the annual meeting of The American Physiological Society on May 2, by a ratio of 4:1.

RESOLUTION: The American Physiological Society, the professional organization of physiologists in this country, expresses its deep satisfaction with the decision of the Appellate Court of California (Third District) entitled, "Concerning the Special Loyalty Declaration of the University of California." It feels justified in so commenting on a judicial matter because of the explicit and wise recognition by the Court of the issue of academic freedom and of the overriding importance of such freedom for the continued intellectual health of educational institutions and of the communities they serve.

The Society further urges its members, if offered appointment at the University of California, to accept only when convinced that the Board of Regents is prepared to function in accord with the tradition of academic freedom long established at this outstanding institution.

Technical Papers

Methonium Halides in High Blood Pressure

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Penta- and hexamethonium halides were found by Paton and Zaimis (*1*) to reduce the blood pressure in lower animals. Organe *et al.* (*2*) and Arnold and Rosenheim (*3*) observed the same effect in man. Paton and Zaimis (*4*) found that this reduction in blood pressure was due, in part at least, to inhibition of autonomic ganglia. The blood pressure fall varies with posture, the magnitude of the fall increasing as the subject becomes more nearly vertical. Restall and Smirk (*5*) showed that administration to high blood pressure patients of two or three subcutaneous injections of penta- or hexamethonium halides daily makes it possible, without adverse symptoms, to secure a more substantial reduction of the blood pressure than has ordinarily been practicable hitherto. Repeated administration induces tolerance; the initial dose of 15 mg therefore has to be increased, sometimes to as much as 200 mg.

Using an electrically driven syringe, selected doses of hexamethonium bromide have been administered by slow subcutaneous injection over a 24-hr period. By refilling the syringe daily the period of continuous subcutaneous injection has been extended to 10 or more days. By this means the blood pressure of severe hypertensives (say, 260/150) has been maintained in many instances at approximately normal levels (say, 130/90) day and night for 10 days or more. Unmistakable and rapid clinical improvement, particularly with the continuous injection, gives support to the view previously expressed (*6*) that the high blood pressure is a link in the chain of causes that lead to the signs and symptoms of essential hypertension by

overstrain and damage of the heart and of blood vessels in various parts of the body.

In successive collaboration with Restall (*5*) and Alstad (*7*) the effects of test doses were studied in 170 patients, and treatment of 1–16 months' duration has been in progress in 68 patients, including hytertension of the malignant, essential, renal, and postpregnancy toxemic types. It is clear that blood pressure reduction can be obtained in hypertension cases, irrespective of the etiology, and also in normal controls. Clinical details of improvement in papilledema, retinal edema, retinal hemorrhages, headache, encephalopathic and dizzy attacks, general congestive heart failure, left ventricular failure, and exercise capacity are given elsewhere (*5, 7–9*).

The observations on normal subjects give direct evidence that the factors responsible for maintaining normal blood pressure levels are influenced by the drugs. In severe hypertensives the effect of a methonium injection may be sufficiently great to reduce the blood pressure by as much as 140 mm Hg systolic and 80 diastolic, which reduction is of the same order as the entire normal blood pressure (120 systolic, 75 diastolic). Hence it seems that the pathological fraction of the high blood pressure in essential hypertension is also reduced by methonium halides.

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A Test of the Infrared Absorption Theory of Olfaction

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Beck and Miles (*1*) have proposed an ingenious explanation for the sense of smell, based on differential radiation losses by the receptors responsible for the function. According to their theory, these receptors radiate and absorb selectively as a result of their size and shape, and when a substance with an absorption band in the appropriate region (8μ–14μ) enters the nasal passages a transient loss of heat will occur, resulting in the perception of smell. Beck and Miles substantiated this theory by experiments performed on certain insects ideally suited for the purpose because of their external olfactory receptors. The difficulty of performing their experiment—i.e., the illumination of the olfactory receptors with radiation passing through an odorous vapor—on humans or mammals in general led us to seek an indirect confirmation of the theory.

A gas in an opaque chamber will approach temperature equilibrium with the walls, a state in which the radiation absorbed and that emitted by the gas are of identical nature. If an odorous gas were enclosed in an opaque chamber at body temperature for a sufficient length of time to come to equilibrium with the chamber walls, and then inhaled through an opaque tube, also at body temperature, the radiation to the walls of the nasal passages would be unchanged. If the theory of Beck and Miles, as interpreted above, is correct, no sensation of smell would be produced, whereas according to the old explanation based on a chemical reaction induced in the nasal passages, the smell would be relatively unaffected by the temperature of the gas.

In an experiment involving this principle, the sensation of smell showed no evident dependence on the temperature of the gas inhaled. The procedure was to submerge a collapsible rubber bag, the connecting rubber tube, and the observer's head, with a small attached diving mask, in a reservoir of temperature-controlled water. Air mixed with vapor of cloves in the rubber bag was inhaled by the observer after he had remained submerged for several minutes, during which time breathing took place through a separate tube. It was calculated that temperature equilibrium for the gas and equipment should have required about 20 sec. A range of temperatures from 36.7° to 42.4° C in approximately 0.5° steps was used. Calculations showed that any cooling of the gas because of expansion while inhaling had a negligible effect.

A second related experiment required no special equipment. In this test the vapor of cloves was inhaled through the mouth, held in the lungs for 15 sec or more, and exhaled slowly through the nose. The odor of cloves was easily discernible in the exhaled vapor despite the fact that the vapor was very close to body temperature.

The failure of these experiments to yield any pronounced disappearance in sensation of smell when the vapor was at body temperature does not necessarily exclude infrared absorption as the basis of olfaction in humans. It becomes necessary, however, to assume that inside the nasal passages there are temperature differences resulting in a sensation roughly independent of the temperature of the gas as it enters the nose. Should this prove untenable, it may be necessary to return to the chemical theory of olfaction for mammals.

An experiment similar to that Beck and Miles performed on insects might be performed on humans. If a sealed tube of material transparent to the 8μ–14μ region, and containing an odorous gas, could be inserted into the nasal passages, the ability or failure to smell this gas would be conclusive evidence for or against the infrared theory.

Addendum. Since the submission of this manuscript for publication, Lloyd H. Beck suggested in a private communication that phenyl ethyl alcohol would have