tition, the non-diffusible portion increased from 4.2 mg. to 4.6 mg., while the diffusible portion from 5.2 mg. to 5.8 mg. The second case, while showing active tetany, received 530 units of the extract in 8 days. The blood calcium increased from 6.5 to 11.1 mg. The non-diffusible fraction changed from 3.1 to 4.6 mg., while the diffusible fraction rose from 3.6 to 6.6 mg. In both cases, under the influence of parathyroid hormone the rise in the diffusible calcium was greater than in the non-diffusible calcium. Plasma proteins again were not significantly altered, though the tendency for the albumin to diminish was appreciable.

To summarize, in the study of serum calcium, emphasis should be laid on its partition, for there are conditions unassociated with tetany but showing a low total serum calcium. In such cases, unlike those of tetany, the reduction is entirely in the non-diffusible calcium, coinciding with a reduction of plasma albumin. The importance of protein in relation to the level of non-diffusible calcium is again brought out by the analysis of pleural and ascitic fluids which with a very low protein content contain mostly diffusible calcium, the non-diffusible being sometimes negligible in amount. Under the influence of either cod liver oil or parathyroid hormone, the elevation of blood calcium seems to be more in the diffusible than in the non-diffusible portion, apparently independently of any change in the plasma proteins. The increase of the diffusible calcium in the cases of tetany is always accompanied by relief of symptoms.

A full report will be published in the *Chinese Journal of Physiology*, July, 1927.

[1] Moritz, A. R., *J. Biol. Chem.*, 1925, lxiv, 81.

[2] Updegraff, H., Greenberg, D. M., and Clark, G. W., *J. Biol. Chem.*, 1926, lxxi, 87.

[3] Clark, E. P., and Collip, J. B., *J. Biol. Chem.*, 1925, lxiii, 461.

[4] Wu, H., and Ling, S. M., *Chinese J. Physiol.*, 1927, i, 161.

3584

The Alleged Ephedrine Action of Two California Species of Ephedra.

BERNARD E. READ AND C. T. FENG.

From the Department of Pharmacology, Peking Union Medical College.

In a recent paper by Clark and Groff[1] it was inferred that ephedrine or closely related substances are present in two California

species of Ephedra. By blood pressure experiments with rabbits a 10 per cent infusion of *Ephedra nevadensis Wats,* was shown to have a marked effect in causing large rises of blood pressure. Other experiments with *Ephedra californica Wats,* indicated that it also contained a pressor material.

Samples of these two varieties of Ephedra were obtained from Dr. Walter Swingle, Department of Agriculture, Washington, and an attempt was made to isolate ephedrine from them. Using similar amounts and identical procedures of extraction there were prepared solutions of the active principles from these two species, and from Peking Ephedra, purchased in local drug stores. The chloroformic extracts were submitted to standard methods of assay, tested with

TABLE I.

Tests of alkaloidal residues from three Ephedras which were assayed by identical procedures.

	Peking Ephedra	*E. californica*	*E. nevadensis*
Titration with N/10 HCl	67.80 cc.	0.82 cc.	2.35 cc.
Equivalent percentage of Ephedrine	1.12 per cent	0.014 per cent	0.04 per cent Very faint tinge
Nagai's test with alkaline $CuSO_4$	Very deep violet	No color	*Very* faint reaction
Nessler's solution	Bulky ppt.	No change	
Average rise in B. P.	32 mm.	0	0.5 mm.

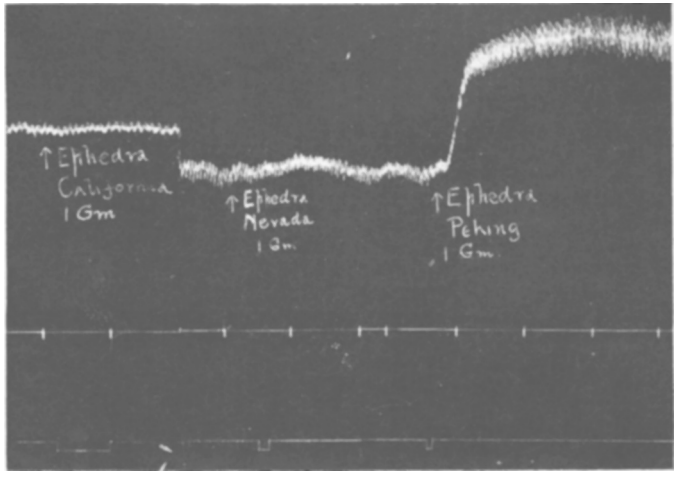

FIG. 1.

Blood pressure tracing of extracts of three Ephedras injected into a male dog, 8.7 kilos, anesthetized with luminal.

alkaloidal reagents and finally compared by Nagai's alkaline copper sulphate test. Then these extracts were used for physiological testing. Three intravenous injections of each of the two Californian Ephedras before and after an identical injection of Peking Ephedra were made with a large dog, suitably anesthetized and canulated for blood pressure tracing.

The chemical assay and testing, as compared with known extracts of specimens of Peking Ephedra containing ephedrine, showed absolutely no ephedrine in our sample of *E. californica, Wats,* nor was there anything more than possibly an exceedingly small trace in *E. nevadensis, Wats.* Both species gave no rise in blood pressure as did the preparations from Peking Ephedra. These results lead to the inference that the results formerly obtained with the infusions of Ephedra were probably due to the presence of simple colloids, and certainly not to basic substances related to ephedrine, unless there be exceedingly great seasonal variation in the alkaloidal content of this plant.

[1] Clark, G. W., and Groff, G. W., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 325.

3585

Blood of Animals in Hematoporphyrin Shock.

HANS SMETANA.

From the Department of Pathology, Peking Union Medical College.

Experiments designed to throw light on the state of the blood of animals sensitized by hematoporphyrin and exposed to light were carried out on cats, guinea pigs, rats and mice.

One to 2 cc. per 100 gm. of body-weight of a 0.5 per cent solution of crystalline hematoporphyrin hydrochloride (Nencki) in n/10 NaoH or 1 to 2 per cent $NaHCO_3$ were injected subcutaneously, intraperitoneally, or intravenously. Sunlight was usually employed. Normal animals and animals similarly injected but kept in the dark were studied throughout as controls.

In preliminary observations no difficulty was encountered in securing the usual reaction of such sensitized animals on exposure of the skin to light.

Exposure of the peritoneum alone was followed by shock, but exposure of blood flowing through a glass canula inserted in the