grösseren Mengen von Siebröhrensaft aufgenommen worden sein konnten. Die Versuche wurden mit alaten und apteren *Virgines* durchgeführt.

Offenbar erkennen also die Aphiden nicht bereits im Parenchym, sondern erst im Phloem der Pflanze die Eignung des Wirtes. Sicher ist die Zusammensetzung des Siebröhrensaftes[9], qualitativ und/oder quantitativ, entscheidend dafür, ob die Laus zunächst die Pflanze als Nahrungsquelle annimmt oder nicht, sodann aber auch dafür, ob eine Reproduktion möglich ist oder nicht[11].

Summary. On *Allium schoenoprasum* L. and *Poa pratensis* L., two species that do not belong to the host plants of *Megoura viciae* Buckt., this aphid pierces the sieve-tubes as in its natural host, *Vicia faba* L. In none of these plants do the aphids take up ^{32}P from the parenchyma. Presumably phloem-sucking aphids probe, before finally settling in the sieve-tubes of the plant, to 'recognize' the quality of the plant.

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Observation on the Adrenergic Innervation of the Skin

Studies on the adrenergic innervation of the skin have given many contradictory results, owing largely to the lack of a specific histological method for the localization of adrenergic nerves in tissues. The osmic acid–sodium iodide technique of CHAMPY[1] has been stated to demonstrate adrenergic nerves selectively[2]. However, the specificity of this method has recently been seriously questioned[3]. Extensive research into the autonomous innervation of the skin has failed to produce any conclusive results on the innervation structures of adrenergic nerves. The present concepts of the autonomic innervation of the skin have recently been reviewed[4–9].

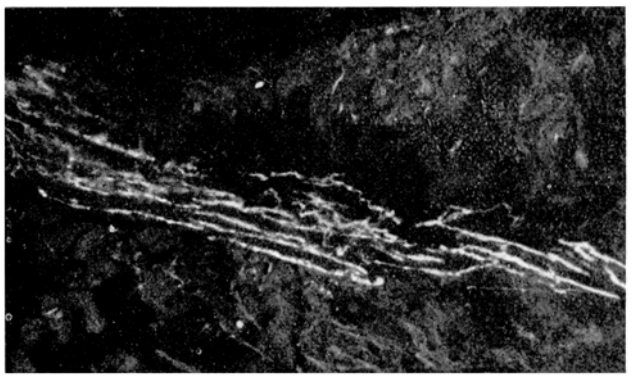
The specific and sensitive method now available, demonstrating catecholamines in adrenergic nerves[10], makes it possible to study the problems more closely.

Material and Methods. Skin specimens were obtained by punch biopsy without anesthesia from 13 adult men and women from the back, thigh, arm and axilla. The specimens were immediately frozen in propane cooled by liquid nitrogen. After freeze-drying they were treated with dry formaldehyde gas. During this treatment certain catecholamines condense with the formaldehyde to intensely fluorescent products. Serial sections (8–10 μ) were studied in the fluorescence microscope with dark-field condensor. For details of the method see FALCK[10]. Pieces of various animal tissues, whose adrenergic innervation has been repeatedly investigated by the present method, were always treated parallel with the human specimens as technical controls. Skin from the back of 6 rabbits and 4 cats was also studied.

Results and Comments. In human skin a strong yellow and green autofluorescence, i.e. not caused by the formaldehyde treatment, was found in connective tissue fibres. This seriously impaired the detection of the green fluorescent adrenergic nerves within the connective tissue itself. However, it did not prevent a study of hair follicles, sebaceous gland, eccrine and apocrine sweat glands, muscles, and vessels since these possessed weak autofluorescence, and since the autofluorescence in the connective tissue contiguous to them was often less disturbing.

A specific, green and intense fluorescence developed in numerous fibres in the arrectores muscles and in a plexus enclosing the smooth muscle layer of the arterial vessels mainly in the deeper layer of the corium. Most of these fibres had the characteristic varicose appearance of axons running in the autonomic groundplexus[11,12]. This was best demonstrated in the arrector muscle where the fluorescence of the nerve fibres contrasted sharply against the dark background of the muscle tissue.

No fluorescent nerve fibres were observed within the epidermis. A weak greenish fluorescence, however, ap-



Fluorescent adrenergic nerve fibres in rabbit arrector muscle.

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peared in many cells in the basal layer. These cells were provided with delicate dendrite-like processes running between the epithelial cells. Their shape and distribution strongly suggested that they were melanocytes. It is at present not possible to identify the compound(s) responsible for this reaction.

In a thin sub-epidermal layer the autofluorescence was weak and confined to fine smooth fibre structures. No varicose fibres were detected here although the conditions for observing their possible presence seemed favourable. Nor were any nerves observed in the non-fluorescent spaces between the connective tissue fibres in the immediate vicinity of or within hair follicles, eccrine and apocrine sweat glands, or sebaceous glands.

In the skin of cat and rabbit a nerve supply similar to that in human skin was found in arterial vessels and in the arrectores pilorum muscles. Although there seemes to be no doubt that the fluorescence reaction demonstrates noradrenaline in adrenergic nerves[10,13], animals that were reserpinized (5 mg/kg subcutaneously) 24 h previous to the biopsy were included in the investigation. No fluorescent nerve fibres were seen in the skin specimens from these animals. Nor did any specific fluorescence develop in skin of the hind leg obtained from cats 3 days after lumbar sympathectomy[14].

There thus seem to be good reasons for believing that the epidermis, hair follicles and sebaceous glands are not supplied with adrenergic nerves. It seems improbable that this can be the case with the sweat glands. In the coiled portion of these there was no autofluorescence (except in small granules in the secretory epithelial cells) and no nerves could be seen. On the other hand, fluorescent vascular nerves in the neighbourhood of the glands could be well observed in spite of the autofluorescent connective tissue fibres.

The results obtained in this study show a more limited distribution of the adrenergic nerves in the skin than most previous studies have suggested[4,5,6,9,15,16].

Zusammenfassung. Adrenerge Nerven in der Haut werden mit einer spezifischen und sensiblen histochemischen Methode für gewisse Monoamine nachgewiesen.

Adrenerge Nerven wurden in den Mm. arrectores der Haare und arteriellen Gefässen, nicht aber in der Epidermis, den Haarfollikeln, Talgdrüsen oder Schweissdrüsen gefunden.

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Cerebral Projection of Group I Afferents in Fore-Limb Muscle Nerves of Cat

Stimulation of group I afferents from stretch receptors in hind-limb muscles does not evoke any surface potentials at the cerebral cortex[1]. On the other hand, some years ago AMASSIAN and BERLIN[2] reported that group I afferents in fore-limb nerves evoke positive potentials in the contralateral somatic area I after a latency of 6–8 msec.

We have now analysed the responses in the somatic receiving areas I and II (SI and SII) that are evoked by stimulation of muscle nerves in the fore-limbs of cats under pentobarbitone anaesthesia (Figure). Monophasic recording from the severed C8 dorsal root at the end of the experiment showed that the group I volley became maximal at 1.5 times threshold and that the group II volley appeared at 1.6 times threshold. In record A, a cortical potential was evoked at a strength eliciting a barely visible ingoing volley. The amplitude of the surface positive potential grew to a maximum with the group I volley (A–D). In some experiments additional activation of group II afferents increased the amplitude of the positive potential, and in the Figure there was an increase of the following negative potential (D and E). The latency of the surface potential was 4.3 to 5.1 msec in the various experiments, when measured to the initial positive deflection signalling the incoming volley (arrow in Figure, C). Similar observations were made on stimulation of the nerve to the long head of the triceps, the biceps, and other muscles.

The potential evoked by stimulation of group I afferents remained after lesions in the lateral and ventral funiculi, but disappeared after lesions in the dorsal funiculi. Fibres in the region of the medial lemniscus were activated from contralateral group I afferents after a delay (the total latency being about 3.0 msec) indicating monosynaptic excitation, as disclosed by tracking with a needle electrode in the upper third of the medulla oblongata. It is concluded that the cortical potential evoked by group I afferents is mediated by the dorsal funiculus–medial lemniscus system.

Evoked potentials appeared in SII only when the stimulus strength had been raised to activate afferents of higher threshold than those belonging to group I (Figure, F–J).

The present experiments indicate that group I muscle afferents in fore-limb nerves project to the SI, but not the SII area of the cerebral cortex. The short latency of the volley reaching the cortex suggests mediation through a disynaptic pathway which is in agreement with the disclosure that the dorsal funiculus–medial lemniscus system is the afferent pathway. Very little summation was needed as indicated by the appearance of the cortical potential very close to the nerve threshold. Hence there is a very efficient synaptic linkage both at the cuneate

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